058.7; 614

THE
PUBLIC HEALTH
LABORATORY SERVICE

BRITISH COUNCIL
30 SEP 1964
MEDICAL LIBRARY

YEAR BOOK

*Incorporating a current Directory of the Service,
together with reports of activities
during the calendar year 1963*

1964

Ann Rep
WA28
.BA1
P97
1964

22502911944

CONTENTS

PAGE

THE PUBLIC HEALTH LABORATORY SERVICE BOARD ii

MEMBERS OF THE BOARD iii

INTRODUCTION

Administration and Organisation of the Service 1

Scope of the Service 3

Grants and other assistance received for special investigations in 1963 5

REVIEW BY THE DIRECTOR OF THE SERVICE OF ACTIVITIES IN 1963 7

SIR GRAHAM WILSON—DR. J. W. HOWIE 15

DISTRIBUTION OF PUBLIC HEALTH LABORATORIES IN ENGLAND AND WALES—MAP 16

DIRECTORY OF THE SERVICE

Headquarters Administrative Office 17

Central Public Health Laboratory 17

Regional Laboratories 17

Area Laboratories 18

Reference Laboratories 22

Special Laboratories 23

Staff in training and seconded to other institutions 23

Reference Experts 24

Vaccines and Sera obtainable through the Service 29

APPENDIX I—Principal Committees and Working Parties 31

APPENDIX II—List of Publications during 1963 33

APPENDIX III—Awards and External Offices accepted by members of the Service during 1963 41

INDEX TO PERSONAL NAMES 42

THE PUBLIC HEALTH LABORATORY SERVICE BOARD

Sir Landsborough Thomson's term of office as Chairman of the Board came to an end on the 31st July, 1963. His retirement marked the close of a long period of devoted work for the Service, which commenced with the organisation and inauguration of its predecessor, the war-time Emergency Public Health Laboratory Service, under the auspices of the Medical Research Council, of which body Sir Landsborough was then Under Secretary. Later, when he became Second Secretary of the Council, his work for the Service continued with its establishment on a peace-time basis, and has now drawn to a close after its consolidation under the provisions of the Public Health Laboratory Service Act, 1960.

Sir Landsborough is succeeded as Chairman of the Board by Dr. E. T. C. Spooner, lately Professor of Bacteriology and Epidemiology at the London School of Hygiene and Tropical Medicine, and now Dean of the School. Dr. Spooner has also been intimately connected with the work of the Service since its early days.

During 1963–64, two new members of the Board were appointed—in succession to Dr. Spooner, following his appointment as Chairman of the Board, and in succession to Professor A. A. Miles, who was compelled to resign his membership by reason of the heavy commitments which have followed his appointment as Biological Secretary of the Royal Society. The two new members are Professor R. E. O. Williams and Professor A. C. Cunliffe, who hold the Chairs of Bacteriology at, respectively, St. Mary's Hospital Medical School and King's College Hospital Medical School in the University of London.

The present membership of the Board is set out on page iii.

THE PUBLIC HEALTH LABORATORY SERVICE BOARD

(1964)

Chairman: E. T. C. Spooner, M.D.
(Dean, London School of Hygiene and Tropical Medicine, London, W.C.1)

Members: P. Alwyn-Smith, M.B., B.S.
(Senior Administrative Medical Officer, Welsh Hospital Board)

A. H. Clough, C.M.G., O.B.E.
(late Under Secretary, H.M. Treasury)

Professor A. C. Cunliffe, M.D.
(Professor of Bacteriology, University of London, at King's College Hospital Medical School, London, S.E.5)

Professor A. W. Downie, M.D., D.Sc., F.R.S.
(Professor of Bacteriology, University of Liverpool)

E. Hughes, M.D., D.P.H.
(Medical Officer of Health, Reading, Berkshire)

J. Stevenson Logan, M.B., Ch.B., D.P.H.
(Medical Officer of Health, Southend-on-Sea, Essex)

J. R. McGregor, C.B., C.B.E., M.C.
(late Director of Finance, War Office)

Charles C. Stevens, LL.B.
(Member of Manchester Regional Hospital Board; Chairman, Macclesfield and District Hospital Management Committee)

Professor C. H. Stuart-Harris, C.B.E., M.D., F.R.C.P.
(Professor of Medicine, University of Sheffield)

D. Thomson, C.B., Q.H.P., D.M., D.P.H.
(Deputy Chief Medical Officer, Ministry of Health)

G. I. Watson, M.D.
(Medical Practitioner, Peaslake, Surrey)

Professor R. E. O. Williams, M.D.
(Professor of Bacteriology, University of London, at St. Mary's Hospital, London, W.2)

Staff Assessors to the Board:
B. Moore, M.D., B.Sc., B.A.O.
Mrs. J. Taylor, M.B., B.Sc., D.P.H.

Secretary:
D. V. T. Fairrie, B.A., F.C.A.

INTRODUCTION

ADMINISTRATION AND ORGANISATION OF THE SERVICE

The Public Health Laboratory Service is the successor of the Emergency Public Health Laboratory Service planned, organised and administered during the war years 1939–1945 by the Medical Research Council, at the request of H.M. Government. In 1945 it was decided by the Government to retain the Service on a permanent footing. Statutory authority was provided by Section 17 of the National Health Service Act, 1946, which empowered the Minister of Health to provide a " bacteriological service " for the control of the spread of infectious diseases. Later the Medical Research Council agreed to an extension of the period of their administration, with the delegation of detailed responsibility to the Public Health Laboratory Service Board appointed by them for this purpose. In 1960, however, the Public Health Laboratory Service Act, 1960, established and incorporated a new Public Health Laboratory Service Board as a statutory body capable of acting in its own right as agent for the Minister. The Act also provided for the transfer of staff of the Service from the employment of the Council to that of the Board, and the transfer of property from the Council to the Minister of Health; these transfers took effect on 1st August, 1961.

The Chairman and members of the Public Health Laboratory Service Board are appointed by the Minister of Health and, in accordance with the Schedule to the Act, the members must include the following (and must therefore be at least eight in number, in addition to the Chairman):

(*a*) not less than two persons appointed after consultation with the Medical Research Council;

(*b*) not less than two persons with experience as bacteriologists, appointed after consultation with such organisations as the Minister thinks appropriate;

(*c*) not less than two persons holding office as medical officer of health to a local authority;

(*d*) not less than one person appointed after consultation with such organisations as appear to the Minister to represent the hospital service;

(*e*) not less than one fully registered medical practitioner engaged in general medical practice, appointed after consultation with such organisations as the Minister may recognise as representative of practitioners so engaged.

The Chairman and members of the Board are normally appointed for a term of three years.

The Board exercises its functions in accordance with any directions received from the Minister of Health. In the exercise of these functions it acts as a principal.

The staff of the laboratories of the Service are appointed and employed by the Board. The scientific staff are selected almost entirely from newly qualified medical graduates after they have held house appointments for 6 to 12 months;

they then receive 5 years' training in pathology and bacteriology. During the third year the trainee is required to obtain the Diploma of Bacteriology of the University of London or the University of Manchester. As a general rule, science graduates without medical qualifications are employed only in the reference laboratories, where the work is of a highly specialised nature. The technical staff is recruited from boys and girls leaving school at 16 to 17 years of age, who have reached the necessary standard of education; they go through a 5-year apprentice system of training.

The development of the Service between 1948—in which year it was established in its present form—and 1962 may be summarised as follows:

	1948	1953	1958	1963
Number of Constituent Laboratories	36	51	58	59
Medical staff	84	110	120	135
Scientific staff		30	29	35
Technical Staff	562	441	507	562
Clerical and Maintenance Staff		303	376	399
Total specimens examined	793,314	1,394,318	1,943,045	2,573,603

At first the material received at the laboratories consisted of sanitary specimens—milks, water, foodstuffs, etc.—and specimens of human and animal origin sent in for bacteriological examination. In 1956, however, after a field trial of the Salk poliomyelitis vaccine carried out with the help of the laboratories of the Service under the aegis of the Medical Research Council, attention was increasingly directed to the examination of specimens for virus infection. By 1958 the majority of the laboratories were able to offer the virus diagnostic service which is now general. In 1963 73,772 virus specimens were examined.

In the early post-war years most of the constituent laboratories were housed in temporary accommodation provided by County Councils, County Borough Councils, University departments and hospitals; a few were in huts or converted houses. However, a programme was soon established for the provision of permanent buildings, designed for their purpose, and sited conveniently for the areas served. It was decided by the Ministry of Health in 1946 that, whenever possible, public health laboratories should in future be situated in hospital compounds, as the need for the integration in the Service of public health and hospital bacteriology became generally recognised. After the Regional Hospital Boards had come into operation, this led to the establishment of joint public health and hospital laboratories. At the present time nearly all major projects for new buildings are of this nature, and the building programme is linked to that of the Ministry of Health for new hospitals.

New public health laboratory buildings or extensive adaptation of old accommodation to house existing units of the Service have been completed at the following places: Oxford (1945); Colindale (Central Public Health Laboratory), Conway, Winchester (1946); Leicester, Sheffield, Worcester (1948); Ipswich, Nottingham (1949); Cambridge, Lincoln, Portsmouth (1950); Bedford, Bournemouth, Brighton, Northallerton, Reading (1951); Bath, Colindale (new extension block), Northampton, Taunton (1952); Guildford, Salisbury (1953);

Norwich, Luton (1954); Leeds (1955); Chelmsford, Newcastle upon Tyne, Swansea (1956); Newport (1957); Derby, Preston (1958); Maidstone (1959); Chester (1960); Glangwili (Carmarthenshire) (1961); Southampton (1963).

New laboratory buildings are under construction at Exeter, Hull and Manchester and further new accommodation is planned for building in the near future at the following places:—Bristol, Cardiff, Fazakerley, Peterborough, Poole and Truro. With the exception of the scheme at Bristol all are joint projects at hospitals and, as in the case of the previous new buildings, they do not represent additional establishments of the Service, but will re-house existing ones.

Laboratory extensions are in progress at Bath, Epsom, Leeds, Lincoln and Oxford.

The Central Laboratory of the Service is situated at Colindale, London, N.W.9, and contains not only a routine Public Health Laboratory serving the adjacent area of Middlesex, but also a number of reference laboratories and specialist departments. There are three small sub-laboratories at Coppett's Wood, Edmonton and Neasden receiving routine public health work from their areas.

There is a separate laboratory at County Hall, London, S.E.1, serving the County of London.

For the remainder of England and Wales there are 57 constituent laboratories and 6 " recognised " ones. These latter are hospital pathological laboratories which undertake the examination of sanitary specimens for the Service in areas where the facilities of a constituent laboratory are not available, or are available only at a long distance with considerable inconvenience.

The total of 59 constituent laboratories includes the following 9 regional ones: Bristol, Cambridge, Cardiff, Leeds, Liverpool, Manchester, Newcastle upon Tyne, Oxford and Sheffield. These regional laboratories, most of which are staffed by three to five medically qualified workers, together with junior bacteriologists in course of training, act to some extent as parent laboratories to a group of area laboratories. Help is provided in the handling of special—e.g. epidemiological—enquiries, and in the provision of staff substitutes during periods of leave or illness.

SCOPE OF THE SERVICE

The routine work of the Service is essentially bacteriological, virological and epidemiological. Apart from certain tests closely associated with bacteriological and virological investigations, chemical and biochemical tests and histological examinations are not performed. Except by special arrangement the Service does not undertake work that is rightly within the province of the hospital or clinical pathologist, but it is ready to offer help when facilities for such work are not otherwise available.

All specimens must be submitted by doctors, veterinarians, dentists, public health inspectors, and others acting on behalf of medical officers of health, Government departments, or representatives of other official bodies; specimens cannot be accepted from private persons.

The routine specimens fall under two main heads:

(*a*) " Medical " specimens received from medical practitioners, infectious diseases hospitals and local authorities. These are specimens of sputum, faeces, throat swabs, blood samples, etc., taken for diagnostic examination from persons suspected of suffering from infectious disease. General practitioners, medical officers of health, school medical officers and others are offered a comprehensive service for the diagnosis, treatment and prevention of bacterial, virological and mycological infections. Medical practitioners are welcomed at all times in the laboratories for the purpose of consultation.

(*b*) " Sanitary " specimens: these are received from medical officers of health, public health inspectors, and others concerned officially with the control of the public health. They comprise specimens for bacteriological examination of water, shell-fish, watercress, sewage, milk and cream; of processed foods such as ice-cream, artificial cream and canned foods; and of imported products such as the various forms of meat, fish, processed egg, coconut and fertiliser. The Service normally examines only material offered to the consumer, but will, of course, examine specimens taken at any stage of production or distribution by medical officers of health investigating suspected food-borne infections. The Service is ready to give free advice to food manufacturers and processors to assist them in the production and distribution of bacteriologically safe products. For routine control of such products, commercial firms are charged a fee, but work of this sort is undertaken only exceptionally.

Brief mention has already been made of the reference laboratories and specialist departments. These provide facilities for the exact identification and " finger-printing " of organisms belonging to many different groups. This is sometimes required by clinicians in their treatment of patients, but more often for epidemiological purposes. The reference laboratories are open freely for use by any laboratory within or without the Service. In addition, a number of reference experts are retained for the examination of occasional specimens which require special skill, special knowledge, or special reagents.

The epidemiological work of the Service includes not only the investigation of outbreaks of infectious disease, in co-operation with local medical officers of health, but also a study of the distribution and behaviour of infectious agents throughout England and Wales. Epidemiological information is collected centrally week by week from public health and hospital laboratories all over the country, including Northern Ireland and parts of Scotland, and then made available to each of these laboratories in return in the form of a confidential weekly summary.

Field investigations of infectious disease, and field trials of protective agents, including vaccines, are frequently carried out. All laboratories are engaged to some extent in research in addition to routine work.

A special feature of the Service is the investigation of various problems by Working Parties containing a dozen or more members drawn from laboratories in different parts of the country. Some of the problems investigated are of direct concern to Government Departments, with which close working relations have always existed.

In addition to normal public health work, an increasing number of laboratories of the Service are undertaking responsibility for clinical bacteriology at hospitals. Arrangements of this kind, involving the association of a public health laboratory with the pathological laboratory of a hospital, provide many advantages, and are frequently requested by hospital authorities. They are readily accepted on condition that there is also a need for public health laboratory facilities in the area.

General information about the current work of the Service is published in the joint " Monthly Bulletin of the Ministry of Health and the Public Health Laboratory Service " which is issued, free of charge, to all medical officers and bacteriologists concerned with epidemiology and public health.

For those who do not receive a free copy, the Monthly Bulletin may be purchased at 1*s.* 6*d.* a copy through the Ministry of Health.

The Service distributes various vaccines and sera on behalf of the Ministry of Health. It also provides certain reagents for diagnostic purposes, prepared by or issued from the Standards Laboratory for Serological Reagents at the Central Public Health Laboratory, Colindale Avenue, London, N.W.9 (*see* p. 23).

GRANTS AND OTHER ASSISTANCE RECEIVED FOR SPECIAL INVESTIGATIONS

In 1963 the Public Health Laboratory Service Board received the following grants to enable special investigations to be undertaken, and major equipment of a special nature to be obtained.

(*a*) From the World Health Organisation:

$5,000 for the assistance of laboratory research on Enteric Phage-typing at the International Centre recognised at the Enteric Reference Laboratory, Colindale, London.

$3,500 for the International Shigella Centre recognised at the Dysentery Reference Laboratory, Colindale, London.

$3,000 for the International Reference Centre for Staphylococcal Phage-typing recognised at the Cross-Infection Reference Laboratory, Colindale, London.

$4,000 towards the cost of testing the specificity of virus antisera at the Standards Laboratory for Serological Reagents, Colindale, London.

(*b*) From the Medical Research Council:

A continuation of the grant of £4,000 a year which was awarded in 1961 for three years, to enable to undertaking of a collaborative study between general practitioners and laboratories of the Service in certain areas to ascertain the pattern of infection in acute respiratory virus diseases. In addition, during 1963 a supplementary grant of £500 a year was approved for certain additional expenses of this enquiry, together with a non-recurrent grant of £924 for special apparatus.

A non-recurrent grant of up to £3,200 for expenses in an investigation of the neurological sequelae of measles.

(*c*) From the National Fund for Poliomyelitis and Other Crippling Diseases:

£1,650 for the purchase of a Reichert Zetopan microscope and ancillary equipment to be used for the study of the morphology of virus by Dr. A. D. Macrae (Director of the Virus Reference Laboratory, Colindale, London).

Grants have been received by the following individual members of the Board's staff:

(*a*) From the Medical Research Council:

Dr. E. S. Anderson (Director, Enteric Reference Laboratory, Colindale, London).

Further provision for expenses, and also for scientific and technical assistance, required for a study of the constitution of the cell in *Salmonella paratyphi B* and related organisms.

Dr. L. Hoyle (Director, Public Health Laboratory, Northampton).

Further provision for the expenses of an investigation of the physical and chemical structure of influenza virus.

Dr. J. C. McDonald (Director, Epidemiological Research Laboratory, Colindale, London).

Provision for an investigation to evaluate gamma globulin in prevention of congenital malformations due to rubella and undefined infections in early pregnancy.

(*b*) From the Wellcome Trust:

Dr. A. Wahba (a Senior Bacteriologist from Egypt, who is a visiting worker at the Cross-Infection Reference Laboratory, Colindale, London).

Personal grant.

(*c*) From the Lady Tata Memorial Fund:

Dr. J. H. Hale (Director, Public Health Laboratory, Newcastle).

Provision for the expenses of a study of changes in chromosome pattern induced by the oncogenic virus on stable (diploid) cell lines, and investigation of possible changes in their type induced by extracts from human tumours and leukaemia.

In addition to the provision of research grants described above, two research projects are in progress jointly with the Medical Research Council, in which members of the Council's scientific staff are collaborating. These are as follows:

Research work on viruses at the Epidemiological Research Unit, Cirencester, Gloucestershire;

Various studies at the Cross-Infection Reference Laboratory, Colindale Avenue, London, N.W.9.

Laboratory Directors of the Service are also carrying out investigations in conjunction with general practitioners and hospital medical officers in many places, notably in the study of chronic bronchitis, of hospital cross-infection, and of sterilisation and disinfection problems.

REVIEW BY THE DIRECTOR OF THE SERVICE OF ACTIVITIES IN 1963

LABORATORIES

The single-room laboratory at Aberystwyth General Hospital was completed and a whole-time technical member of the Public Health Laboratory Service staff was put in charge. For administrative purposes it is being regarded as a sub-laboratory of Carmarthen, so that Dr. Morgan can be made finally responsible for it and undertake any epidemiological investigations required; though Dr. Beasley, the hospital pathologist, has kindly agreed to exercise daily supervision over the bench work. The laboratory is carrying out the hospital as well as the public health bacteriology.

During the course of the year three other laboratories have been asked to carry out the bacteriological work for the local hospital. At Manchester, where a new public health laboratory is to be built at Withington, arrangements were made for Dr. D. M. Jones, a member of the Monsall laboratory staff, to be seconded whole time to the Withington Hospital. At Nottingham Dr. Mitchell, for a short while assisted by Dr. Cavanagh, took charge of the bacteriological work at the City General Hospital; and at Wrexham arrangements were made for Dr. Bassett, a member of the Chester laboratory, to work half-time at the Maelor General Hospital and to be responsible, under Dr. Pauline Poole's general supervision, for the bacteriological work of the Group.

At Middlesbrough, with the assistance of the Newcastle Regional Hospital Board, a small virus laboratory was provided for Dr. Blowers by the conversion of an adjacent outlying building. This will now enable him, with the help of a trained technician, to carry out virological examinations of specimens which previously had to be sent to Newcastle.

In spite of hopes and promises, the extension of the joint hospital and public health laboratory at Oxford was still not completed, and the staff had to continue work in borrowed premises under extremely cramped conditions. It is a credit to Dr. Vollum and those under him that they have been able to carry out their duties for three years now under conditions of gross overcrowding and inconvenience.

At Bristol where accommodation at Canynge Hall is likewise very restricted, the United Bristol Hospitals Board kindly offered the Public Health Laboratory Service a piece of ground on St. Michael's Hill on which to build a new laboratory. The site is a good one, being opposite the new Medical School and close to other departments of the University. Mr. Humphrey Goldsmith of Bath, who designed the Taunton and Swansea laboratories, has been engaged to prepare plans for a suitable building.

Though the laboratory at Truro is a constituent laboratory, it has for many years been administered by Dr. Hocking, the hospital pathologist. The space available is too small for the needs of a full Public Health Laboratory. Dr. Hocking, however, is retiring in 1964, and the South Western Regional

Hospital Board have asked the Public Health Laboratory Service Board to take over responsibility, when he leaves, for the hospital bacteriology. This has been agreed to; but before the new consultant, Dr. Barrow, can take up his work, a small temporary hutted laboratory will have to be built to eke out the present inadequate space and to provide accommodation until the new laboratory is completed at Treliske.

As in the two previous years, 1963 saw changes in the senior staff. Dr. R. M. Fry, one of the original members of the Emergency Service, retired at the end of September from the directorship of the Cambridge Laboratory. Stationed first of all at Gloucester, Dr. Fry was soon transferred to Carmarthen where, with the help of Dr. Joan Boissard, he built up a thriving laboratory. His success there was equalled at Cambridge, to which he was moved shortly after the war. He is succeeded by Dr. G. R. E. Naylor, a Senior Lecturer in the Department of Pathology and a Fellow of Caius College, who—with his experience of routine bacteriology in the Army and hospital laboratories, and of teaching and research in the University—is well fitted for the post. As adumbrated in last year's report, Dr. B. P. Marmion, an experienced virologist, left the Leeds laboratory at the end of February to take up the Chair of Microbiology in the New Monash University at Melbourne. His post as Regional Virologist has not yet been filled. Dr. A. Bernstein left the Enteric Reference Laboratory in the summer for an Associate Professorship at Marquette University School of Medicine at Milwaukee; his place will likewise be difficult to fill. Another serious loss from Colindale was that of Dr. N. S. Galbraith, who had distinguished himself by his excellent field investigations into food poisoning and by the competent way in which he helped to organise and carry through the Sabin poliovaccine trial; he left to take up the post of Deputy Medical Officer of Health at East Ham. Dr. K. E. A. Hughes, who was due to retire in December from the head of the Portsmouth Laboratory, was asked to stay on for a couple of months till Dr. Payne, who is to succeed him, could hand over the Northallerton Laboratory to Dr. J. C. Wallace. Dr. J. W. G. Smith, who had been seconded to the London School of Hygiene and Tropical Medicine, accepted the offer of a Senior Lectureship in the Department of Bacteriology there and terminated his appointment with the Service at the end of September. Dr. Faith Maurice-Williams (Mrs. Born), one of the younger virologists, left Colindale at the beginning of June to accompany her husband to the United States. We thus lost the services of a worker of considerable promise. Dr. W. C. Harris, a member of the staff of the Conway Laboratory, who was seconded to the Royal Alexandra Hospital at Rhyl to take over the bacteriology of the whole of the Clwyd and Deeside area, left in the autumn to take up a post he had been offered as Bacteriologist at the National Defence Medical Centre at Ottawa. Dr. Harris is the latest of the not inconsiderable number of members of the Service who have been attracted to posts in North America. His place at Rhyl was taken by Dr. P. W. W. Griffiths from the Bristol Laboratory. Dr. I. D. G. Richards left the Cross-Infection Reference Laboratory for a post at Cardiff University.

Apart from those who retired or resigned, Dr. D. Taylor-Robinson left in the autumn to work for a year in Dr. Chanock's laboratory in the National Institutes of Health at Bethesda, Md., studying the growth and properties of *Mycoplasma pneumoniae*, the so-called Eaton agent of primary atypical pneumonia, which was referred to in last year's report. Dr. P. Cavanagh, after gaining his Diploma in Bacteriology, was seconded for two or three years to help in the teaching of Bacteriology in the University at Khartoum. Dr. E. M. Mackay-Scollay returned in the autumn from the Tuberculosis Chemotherapy Centre at Madras, to which he had been seconded for two years, and resumed the directorship of the Stafford Laboratory.

All five candidates who took the Diploma in Bacteriology course at the London School of Hygiene and Tropical Medicine succeeded in passing their examination. Eight students, some of them directors of laboratories, attended a fortnight's course in Mycology given by Dr. I. G. Murray at the School of Hygiene, and came away full of praise for the way in which they had been taught.

Finally, mention may be made of Professor G. Payling Wright, who retired at the end of the academic year from the Chair of Pathology at Guy's Hospital. Though not a member of the Service, he had given invaluable help in initiating junior trainees seconded to his Department into the study of Pathology. Besides providing them with a general background training, he invariably took them into his own laboratory, where they joined with him in problems he was investigating and thus obtained an early insight into the research field. The Service has every reason to be grateful for the stimulating effect he had on many of its young recruits. (The news of Professor Payling Wright's sudden death on 4th April, 1964, was a great shock.)

VISITS AND VISITORS

Several members of the staff paid visits abroad during the course of the year to attend congresses or take part in Symposia. Dr. S. T. Cowan visited Cleveland, Ohio, and Ames, Iowa, in May to attend a meeting of the American Society for Microbiology and to collaborate with Dr. Buchanan in plans for the next edition of Bergey's Manual of Determinative Bacteriology. Dr. N. S. Galbraith was invited to read a paper on the surveillance of poliomyelitis before the 9th European Congress at Stockholm in September; and Dr. A. J. H. Tomlinson and Dr. Joan Davies were invited to give an account of their work before the same Congress. Dr. L. Hoyle accepted an invitation to the 3rd National Congress of the Czechoslovak Biochemical Society and lectured on the Biochemistry of Viruses. Dr. E. H. Gillespie and Dr. Betty Hobbs were both asked to speak before the International Conference on Food Microbiology at Rome in April; and Dr. Betty Hobbs further visited Copenhagen and Roskilde to discuss with Danish workers the pasteurisation of egg albumen and the bacteriology of meat. Dr. E. S. Anderson went to Zermatt in a consultant capacity after the outbreak of typhoid fever there in the early part of the year, and Dr. A. J. H. Tomlinson went to Iran in a similar capacity to advise on the equipment to be purchased by the Central Treaty Organisation for the public health laboratories. Dr. M. T. Parker and Mr. W. R. Maxted contributed by invitation papers before the Symposium on streptococci at Jena; Dr. Joan Taylor and Dr. Betty Hobbs took part in the Symposium in Paris on salmonellae in foods; Dr. A. E. Wilkinson attended at Copenhagen a meeting of the Medical Society for the Study of Venereal Diseases; Dr. Marguerite Pereira was invited by the World Health Organisation to take part in the Seminar on Respiratory Virus Diseases at Moscow; and Dr. J. C. Kelsey, after participating in the National Conference on Institutionally acquired Infections at Minneapolis, visited the Communicable Diseases Centre at Atlanta and lectured on sterilisation.

Three visits were paid by members of the Service for special purposes: Dr. N. S. Mair to Los Angeles to work for three months at the Children's Hospital on the bacteriology of acute mesenteric lymphadenitis; Dr. B. E. Andrews to Leiden for a few days to discuss with Dr. Hers the methods for diagnosing infection with *Mycoplasma pneumoniae;* and Dr. S. P. Lapage to the State Serum Institute at Copenhagen to assist in electronmicrographic studies of *Haemophilus vaginalis.* Miss Betty Whyte derived benefit from a visit to the United States in June, where she attended the 2nd International Congress on Medical Librarianship at Washington and subsequently visited various libraries to study their methods. Eight members of the Service took part in the joint meeting at Oslo and Bergen in May of the Pathological Society of Great Britain and Ireland and the Norwegian Pathological Society.

Once more postgraduate students from many countries sent by their governments or brought over under the auspices of the World Health Organisation, the British Council, and other bodies, came to work at Colindale, at the laboratories at Cardiff, Chelmsford, Leicester, Manchester and Newcastle, and at the Tuberculosis Reference Laboratory.

Two short courses in epidemiology were arranged at Colindale for World Health Organisation Fellows from India and from European countries, who were studying in Great Britain.

Short-term visitors included Dr. P. M. Kaul, Assistant Director-General of the World Health Organisation; His Excellency Lij Kassa Wolde Mariam, President of the Haile Selassie I University at Addis Ababa; Dr. A. W. Donaldson, Deputy Chief of the Communicable Disease Center, Atlanta, Georgia, U.S.A.; and a party of Russian doctors recruited by the World Health Organisation for service as Medical Officers.

COMMITTEES

The Working Party on Salmonellae in Home-produced Meat completed its work, prepared its report, and was wound up. A small committee was formed to decide on the best type of protective cabinet to use in the Service for work on tuberculosis and virus diseases. Protective cabinets have been in use now for a few years and found very valuable, particularly in enabling potentially dangerous work to be carried out in a main laboratory instead of in a specially ventilated room set aside for the purpose. Numerous types of cabinet are available, and it is the object of the committee to discuss their advantages and disadvantages.

A preliminary comparison in April of the growth properties of the same culture media made up by various laboratories revealed such striking differences between them that it was decided to form a Working Party to make a thorough investigation into the reasons for this unexpected result. Owing to the variable composition of some of the reagents, and to the multiple factors such as concentration of ingredients, acidity, degree of heating, and nature of filtration, complete uniformity cannot be expected; but the discrepancies observed at the preliminary trial were greater than they should have been, and created justifiable misgiving among those who took part. The subject is fraught with difficulty because even in the same laboratory results are not always reproducible and the behaviour of the same medium is subject to variation from time to time.

Measurement of the amount of work done in a laboratory has exercised the minds not only of laboratory workers themselves but of statisticians who have been asked to advise on the best method to employ. For many years the hospitals in the National Health Service experimented with a unit system, whereby so many units were allotted to the examination of each individual sample. Besides being tedious and demanding much expenditure of clerical time, this system was open to a good deal of manipulation of one sort or another, so that the number of units scored by different laboratories for the same type of work was subject to considerable variation. The unit system was succeeded by other systems, none of which proved satisfactory. Some years ago the Public Health Laboratory Service devised a modified unit system in which the average time taken in all the laboratories of the Service for the examination of a given type of specimen was worked out. The unit was set at 10 minutes, so that a specimen requiring on an average a period of 30 minutes for its examination was scored at three units. All that was required then of the laboratories was to submit their annual returns of specimens divided up into about a dozen categories, so that the number of units could be calculated at headquarters by simple multiplication. On the whole this system, which needs practically no extra clerical work, has proved satisfactory, and has had the great merit of enabling a fairer comparison to be made between laboratories than is possible on a specimen basis. A laboratory, for example, examining a large number of samples requiring an average of only 10 minutes each is at a great advantage on a specimen basis over a laboratory examining a quarter of the number of samples each requiring an average of 60 minutes, but on the unit basis it is shown to be doing actually less work. The system is not perfect, however, and a committee has been set up to examine how best to use a simple measurement of laboratory work as an index of staff requirements.

Now that the Cross-Infection Reference laboratory has come into good working order, it seems timely to look more closely than has so far been possible into the resistance of pathogenic organisms to antibiotics. Hitherto this work has been carried out mainly by hospital bacteriologists and by those interested in genetic and metabolic behaviour. But a big field of investigation is open, and a group of experts are considering a proposal for establishing a working party to make a comprehensive study of this problem.

SCIENTIFIC WORK

Congenital Malformations.—The observations in Australia of Gregg and of Swann and his colleagues during the war on the occurrence of abnormalities in infants born of mothers who had suffered from rubella (German measles) during pregnancy opened up a series of possibilities that had not previously received much attention. If rubella contracted during the first three months of pregnancy could damage the foetus, might not the viruses of other diseases do likewise? A number of inquiries have been made, chiefly into rubella to find out more precisely the frequency with which congenital abnormalities occur, but also to some extent into diseases such as measles, influenza, smallpox, poliomyelitis and mumps. There are two main ways of carrying out such an inquiry—the retrospective and the prospective. In the retrospective method cases of abnormality in the infant recognised within one or two years after birth are recorded, and an investigation is then made into the history of infectious disease of the mother during pregnancy. A more reliable but also more time-consuming method, less dependent on the memory of the mother, is the prospective method, in which the occurrence of disease during pregnancy is noted at the time, and the mothers are then followed to see whether they give birth to normal or abnormal infants. At the moment the Epidemiology Research Laboratory has three investigations in hand. One of them which is being carried out in collaboration with the College of General Practitioners is of the retrospective type. Members of the College are notifying defects in the infants, in relation particularly to their seasonal occurrence. In another investigation a study is being made of the protective action of gamma globulin given during the first three months of pregnancy to women who have been exposed to infection with rubella. With the help of the Medical Research Council 30,000 women are being kept under supervision. The third investigation is even more ambitious. It was designed to find out what infections other than those already mentioned might interfere with the development of the foetus. For this purpose a large number of the laboratories arranged for blood specimens to be withdrawn from women between the 12th and 16th week of pregnancy so as to be able to detect antibodies present as the result of a recent recognised or unrecognised infection. This investigation is nearly completed. Altogether sera were collected from 12,000 women. As it was impracticable to examine all of these against the 30 or 40 antigens considered desirable, a 10 per cent. sample was drawn at random for comparison with those from pregnancies which ended in some abnormality. To ensure uniformity of technique, the actual testing for many of the infections was carried out by two experienced technicians working side by side at Colindale; the remainder were dealt with individually in a small number of other laboratories. The analysis of the results should be of more than usual interest.

Influenza Vaccine.—Numerous trials to determine the protective effect of different influenza vaccines have been made in this country, and the United States and Soviet Russia. One of the chief difficulties is to decide on the composition of the vaccine. The influenza virus is liable to variation in the nature of its antigenic content, so that a vaccine prepared with a strain current one year may be inappropriate to guard against the virus of the following year. Again, the protection afforded even against the same virus by aqueous vaccines seems to be fairly transitory, and the local and systemic reactions to which such vaccines have sometimes given rise are more severe than can be readily tolerated. To provide a stronger antigenic stimulus and to render the protection more long lasting, the Medical Research Council assisted by members of the Service has been experimenting with inactivated oil adjuvant vaccines. One set of trials recently completed was carried out in conjunction with general practitioners, chest clinics, and factory workers of Imperial Chemical Industries; and another, again in conjunction with general practitioners, on elderly people in whom an attack of influenza may prove fatal. In a third trial, a live vaccine prepared from a strain of influenza A virus was given to recruits in the Royal Air Force. This constitutes the first large-scale trial in Great Britain of a living influenza vaccine.

Vaccination Against Measles.—Since Enders and his colleagues in the United States found out how to grow the measles virus in tissue culture, interest has been taken in the possibility of vaccinating against the disease. Several trials have been made, some with inactivated vaccines, and some with living attenuated virus, given either alone or together with gamma globulin to lessen the subsequent reaction. The ideal vaccine has not yet been found, but, even if a satisfactory one was available, the question would still be asked whether measles was a disease worth protecting against. Though extremely prevalent, it is now so mild that the mortality is almost negligible. If vaccine is to be given, it must therefore be on other than life-saving grounds. The disease is often complicated by respiratory disturbances, particularly pneumonia, which used to be fatal but which now can generally be successfully treated by chemotherapeutic or antibiotic substances. It may also be complicated by neurological disturbances, especially encephalitis. How frequent these various complications are in this country and what permanent damage they inflict on the bronchial tract, lungs and brain is not known with any degree of certainty; but if the permanent consequences should prove to be of sufficient frequency and severity, then a strong case could be made out for the routine protection of infants and young children by vaccination. Two or three inquiries to obtain information on these points are in progress, among which is a study by the Epidemiological Research Laboratory. With the help of the medical officers of health of 45 County Boroughs, a follow-up survey is being made of 50,000 notified cases of measles. This should suffice to afford an indication of the nature and frequency of complications, and it is hoped that further studies will throw light on the permanency of their effects.

Quadruple Vaccine.—Apart from measles, vaccines are now given to children against six infectious diseases—diphtheria, whooping cough, tetanus, smallpox, poliomyelitis and tuberculosis. The problem of administering these vaccines is a serious one, particularly when some of them demand three doses. One solution of the difficulty is to combine two or more of the antigenic agents in a single vaccine, so as to cut down the number of injections. Many local authorities are already using a triple vaccine against diphtheria, whooping cough and tetanus, but more recently a quadruple vaccine has been introduced containing in addition the three types of inactivated poliomyelitis virus. Whether this vaccine will afford such strong and lasting protection as the live attenuated Sabin poliovaccine given by the mouth apart from the triple vaccine is doubtful, but an investigation is now being carried out by nine public health laboratories to provide information on the immediate response to the vaccines given separately or together. There are objections, which cannot be considered here, to the use of combined vaccines, and there is reason to believe that the live oral vaccine gives a stronger intestinal immunity to the poliomyelitis virus than the inactivated vaccine. On the other hand, the advantages of combined vaccines are so great that administrative reasons alone may compel their use; and their possible inferiority in protection against poliomyelitis may perhaps be overcome by giving the live oral vaccine later.

Watercress.—On the sanitary side two or three investigations may be referred to. The purpose of one of these, which is being carried out by a Working Party, is to survey the conditions under which watercress is cultivated, to determine the extent of its bacterial pollution, to consider methods for its purification, and to suggest a standard of cleanliness for the marketed product. This last aim is likely to prove difficult. On analogy with water, some medical officers of health are using a standard of their own based on the presence of *Escherichia coli.* In water this organism is an excellent indicator of excretal pollution, usually of human origin. This is also true of shell-fish; but it is not true of foods, including watercress, in which *E. coli* may be derived from other sources and in which it may multiply, thus preventing the original degree of contamination, from whatever source, from being known.

Disinfectants.—There is probably no branch of Medicine in which so much variation exists as in the choice and use of liquid disinfectants. Many of those used in hospitals are unsuitable for the particular purpose for which they are intended, or are used in an unsuitable strength, or for too short a time, or under conditions that interfere with their activity. The choice often seems to be haphazard and their practical application quite arbitrary. A Committee to look into the testing and evaluation of disinfectants was set up in 1961, and is making slow but substantial progress in its task. Its main approach so far has been to find out what in fact is the present practice in British hospitals. In conjunction with the Statistics Branch of the Ministry of Health, a questionnaire was prepared and sent out to 166 hospitals in England and Wales, asking them to report on the use of 53 liquid disinfectants. Analysis of the returns, which are now complete, has revealed extreme, though not altogether unexpected, variations between different hospitals, even in the same Region. The Committee hopes to put forward suggestions for limiting the number of disinfectants employed, and to define the particular purpose for which any given disinfectant is recommended and the conditions under which it should be used.

Pasteurisation of Liquid Egg.—In this country the main cause of food poisoning is the *Salmonella* group of organisms. Though widely distributed in the animal kingdom, the chief reservoir of these organisms is poultry. Liquid and other forms of egg are extensively used in commerce and, whether home-produced or imported from abroad, are contaminated to a greater or less extent with salmonellae. Human beings are liable to infection from bulked egg that accidentally contaminates uncooked food in which salmonellae can grow or that is consumed in products which are insufficiently cooked; numerous outbreaks and large numbers of sporadic cases of food poisoning and paratyphoid fever are attributable to these types of food. The Service has been pressing for some years for official action to control what is undoubtedly a preventable cause of food poisoning. Regulations have at last been introduced insisting on pasteurisation of all liquid egg. The actual processing is not easy, and will probably not be as effective in destroying pathogenic organisms as in the pasteurisation of milk. Nevertheless it will probably render many batches of egg completely safe and greatly reduce the danger of others. The degree of heat treatment the egg has received can be gauged in the laboratory by means of the α–amylase test—a test that was devised at the Low Temperature Research Station at Cambridge and that, like the phosphatase test for milk, depends on the destruction of an enzyme. Arrangements have been made for a dozen or so public health laboratories to carry out the test.

Other Investigations.—Analysis of the results of the *Enterovirus Survey*, mentioned in last year's report, is nearly complete. It has taken longer than expected, owing to the delay in the final identification of many of the virus strains isolated.

The *Respiratory Virus Survey* has been running for a year and is expected to continue for another two or three years. Considerable difficulty was experienced in obtaining the right type of material for examination. The limitations that were imposed have now been regarded as unnecessarily stringent, and will in future be relaxed. The results, though fewer than hoped for, are encouraging and hold out promise for the ultimate success of the Survey.

The Epidemiological Research Laboratory continues with its task of *Poliomyelitis Surveillance.* The object is to detect any case of poliomyelitis that might possibly be related to the use of vaccine. Medical officers of health throughout the country are co-operating in making a return of all cases of the disease diagnosed in their area together with a history of vaccination. So far no case has yet come to light that could be shown with any reasonable degree of probability to result from the use of the live vaccine. Meanwhile the incidence of poliomyelitis continues to fall and is now lower than at any time since the disease flared up in 1947.

SIR GRAHAM WILSON

DR. J. W. HOWIE

Sir Graham Selby Wilson, M.D., LL.D., F.R.C.P., D.P.H., Director of the Emergency Public Health Laboratory Service 1941–1945, and Director of the permanent Service since its inception on 1st April, 1945, retired on 30th September, 1963.

Sir Graham had been associated with the late Professor W. W. C. Topley in planning the original E.P.H.L.S. in the months just before the war. At first, he directed the Oxford laboratory, one of the two laboratories outside London which served as the central laboratories of the wartime Service. In 1941, he succeeded as Director the late Dr. W. M. Scott, who was killed in an air raid.

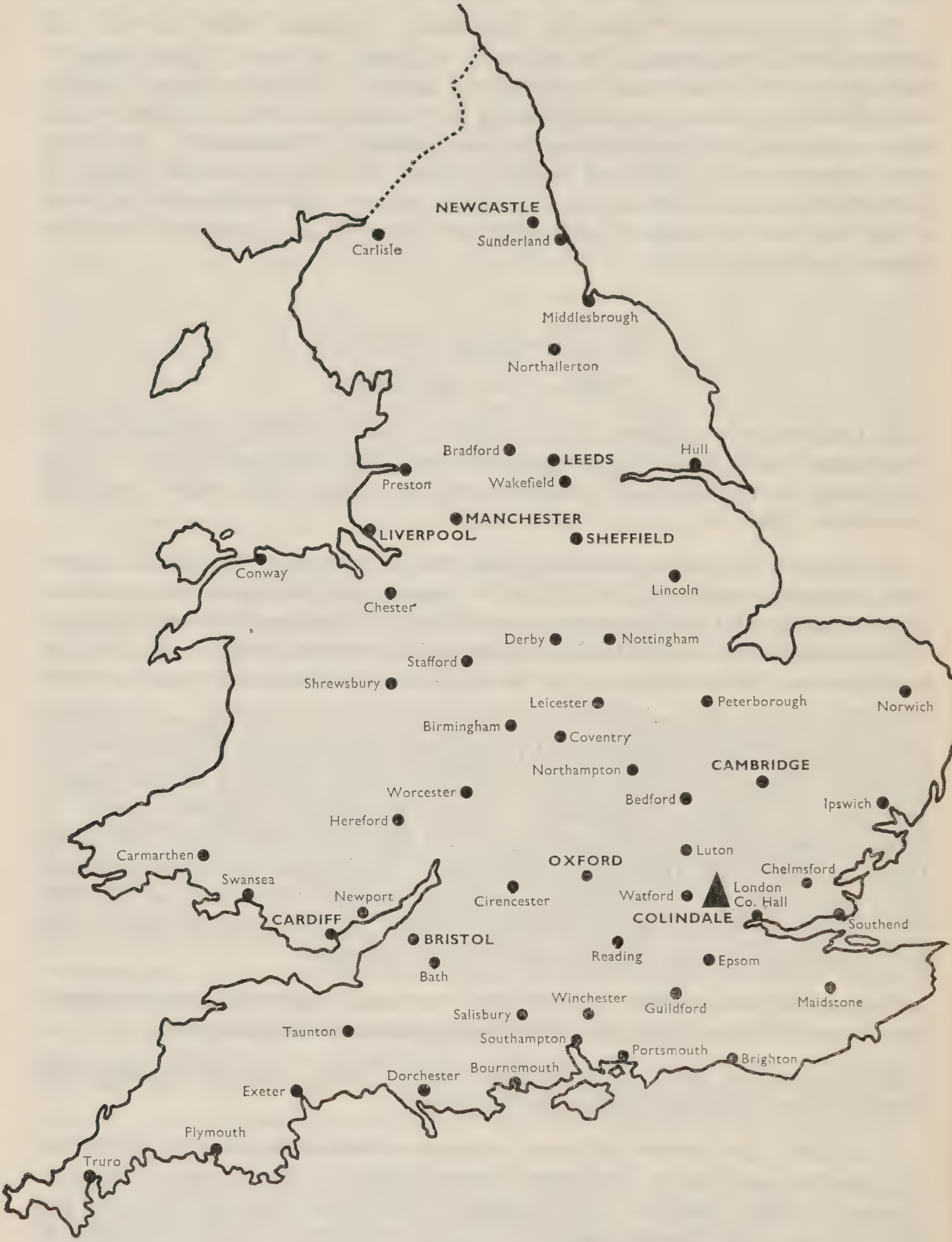
Before joining the Service, " G.S." was Professor of Bacteriology as Applied to Hygiene in the London School of Hygiene and Tropical Medicine. With Professor Topley, he wrote what is still the leading textbook in the English language on medical bacteriology. The distinguished academic career of teaching and research that he gave up to join the Service had placed him in the forefront of the world's medical bacteriologists. His intimate firsthand experience of so many aspects of his subject, including especially his work on *Brucella* on tuberculosis and on the bacteriology of milk, qualified him to lead as well as to direct the Service which he did so much to create.

He was knighted in 1962. All who have been associated with him are grateful for the work he has done, and wish him happiness in his retirement.

On 1st October, 1963, James William Howie, M.D., F.R.C.P. (London and Glasgow) succeeded Sir Graham as Director.

From 1951, Dr. Howie had been Professor of Bacteriology in the University of Glasgow and Senior Consultant Bacteriologist to the Western Infirmary, Glasgow. From 1946–1951 he was Head of the Department of Pathology and Bacteriology at the Rowett Research Institute, Aberdeen. He was a member of the Agricultural Research Council from 1957–1963, and is a Vice-President of the College of Pathologists.

Dr. Howie brings to his new task a wide experience of bacteriology in the health services and a very distinguished record of work.


NEWCASTLE
Carlisle
Sunderland
Middlesbrough
Northallerton
Bradford
LEEDS
Hull
Preston
Wakefield
MANCHESTER
LIVERPOOL
SHEFFIELD
Conway
Lincoln
Chester
Derby
Nottingham
Stafford
Shrewsbury
Leicester
Peterborough
Norwich
Birmingham
Coventry
Northampton
CAMBRIDGE
Worcester
Bedford
Ipswich
Hereford
Luton
Carmarthen
OXFORD
Chelmsford
Swansea
Newport
Cirencester
Watford
London
Co. Hall
CARDIFF
COLINDALE
Southend
BRISTOL
Reading
Epsom
Bath
Winchester
Guildford
Maidstone
Salisbury
Taunton
Southampton
Portsmouth
Brighton
Bournemouth
Dorchester
Exeter
Plymouth
Truro

DIRECTORY OF THE SERVICE

HEADQUARTERS ADMINISTRATIVE OFFICE

24, Park Crescent, London, W.1
Tel.: Museum 2223

J. W. Howie, M.D., F.R.C.P. (*Director of the Service*)
S. T. Cowan, M.D., D.Sc., Dip. Bact. (*Deputy Director of the Service*)
D. V. T. Fairrie, B.A., F.C.A. (*Secretary of the Board*)
C. K. Whitaker (*Finance Officer and Deputy Secretary of the Board*)
Sir Graham Wilson, M.D., LL.D., F.R.C.P., D.P.H. (*Special Duties—part-time*)

CENTRAL PUBLIC HEALTH LABORATORY

Colindale Avenue, London, N.W.9
Tel.: Colindale 7041
Telegraphic Address: Defender London N.W.9

Administration

S. T. Cowan, M.D., D.Sc., Dip. Bact. (*Administrative Director: see also p. 23*)
M. T. Parker, M.D., Dip. Bact. (*Deputy Administrative Director: see also p. 22*)
J. D. Atkinson, M.B.E., F.I.M.L.T. (*Senior Technical Officer*)
Miss B. H. Whyte, M.A., A.L.A. (*Librarian*)
Miss A. Bowman, M.A., A.L.A. (*Assistant Librarian*)

Routine Diagnostic Laboratory and Sub-Laboratories

C. E. D. Taylor, M.A., M.D., Dip. Bact., F.R.S.H. (*Director*)
Mrs. L. Limb, B.Sc. (*part-time*)
B. T. Thom, M.B.
Mrs. J. M. Wood, B.Sc. (*part-time*)
A. J. Zuckerman, M.Sc., M.D., D.Obst.R.C.O.G.
Miss R. C. J. James (Mrs. Barkham), M.B., Dip. Bact. (*part-time: at Public Health Laboratory, Neasden Hospital, Brentfield Road, N.W.10. Tel.: Willesden 1422*)
K. A. Machacek, M.D., D.P.H. (*at Public Health Laboratory, Coppett's Wood Hospital, Coppett's Road, N.10. Tel.: Tudor 1990*)
Miss M. E. M. Thomas (Mrs. Livingstone), M.B., B.Sc., D.P.H. (*part-time: at Public Health Laboratory, Town Hall, Edmonton, N.9. Tel.: Edmonton 7625*)

(*See also* pp. 22–23 for Reference and Special Laboratories located at Colindale)

REGIONAL LABORATORIES

BRISTOL:
Public Health Laboratory, Canynge Hall, Whatley Road, Clifton, Bristol, 8.
Tel.: Bristol 38257

H. R. Cayton, M.B. (*Director*)
Miss S. K. R. Clarke, M.D.
C. A. Morris, B.Sc., M.B., Dip. Bact.

CAMBRIDGE:
Public Health Laboratory, Tennis Court Road
Tel.: Cambridge 55526

G. R. E. Naylor, M.D., M.R.C.P. (*Director*)
Miss J. M. Boissard, M.R.C.S.
J. Nagington, M.D., Dip. Bact.

CARDIFF:

(*a*) Public Health Laboratory, Institute of Pathology, 3rd Floor, Royal Infirmary
Tel.: Cardiff 24385

(*b*) Public Health Laboratory, Institute of Preventive Medicine, The Parade
Tel.: Cardiff 29110

Professor Scott Thomson, M.D., F.R.C.P.E., D.P.H. (*Director*)
A. D. Evans, M.B., B.Sc., Dip. Bact.
R. W. S. Harvey, M.B., B.Sc., Dip. Bact.
Miss D. E. Mahabir, M.B., Dip. Bact.

LEEDS:

Public Health Laboratory, Bridle Path, York Road, Leeds, 15
Tel.: Leeds 645011

G. B. Ludlam, M.D., D.T.M. & H., D.L.O. (*Director*)
T. Brown, B.Sc.
M. H. Hambling, M.D., D.(Obst.) R.C.O.G.
W. Odrzywolski, M.D.

LIVERPOOL:

Public Health Laboratory, 126, Mount Pleasant, Liverpool, 3
Tel.: Liverpool Royal 3636/7

Professor D. T. Robinson, M.Sc., M.R.C.S., Dip. Bact. (*Director*)
Miss E. C. Armstrong, M.D., Dip. Bact.
C. I. Ashton, B.Sc.
Miss M. B. Baillie, M.Sc., Ph.D.
G. B. B. White, M.R.C.S., Dip. Bact.

MANCHESTER:

Public Health Laboratory, Monsall Hospital, Manchester, 10
Tel.: Manchester Collyhurst 2733/4

J. O'H. Tobin, B.M., Dip. Bact. (*Director*)
J. D. Abbott, M.D., Dip. Bact.
J. E. Cradock-Watson, B.M.
D. M. Jones, M.D., Dip. Bact.
Miss J. M. Watkinson, B.Sc.

NEWCASTLE:

Public Health Laboratory, Institute of Pathology, General Hospital, Westgate Road, Newcastle upon Tyne, 4
Tel.: Newcastle 38811, Ext. 297

J. H. Hale, O.B.E., M.D., M.R.C.P. (*Director*)
H. R. Ingham, M.B.
J. B. Selkon, M.B., D.C.P.

OXFORD:

Public Health Laboratory, Radcliffe Infirmary
Tel.: Oxford 49231/2

R. L. Vollum, D.Phil. (*Director, part-time*)
B. R. Eaton, M.B., D.C.H.
W. H. H. Jebb, M.D., Barrister-at-Law (*Deputy Director*)
H. H. Johnston, D.Phil.
A. H. Tomlinson, D.Phil.

SHEFFIELD:

Public Health Laboratory, City General Hospital, Sheffield, 5
Tel.: Sheffield 387253

E. H. Gillespie, M.B. (*Director*)
J. F. Archer, M.B., Dip. Bact.
C. D. Plows, M.B.
Miss M. A. M. Wilson, M.B., Dip. Bact. (*Deputy Director*)

AREA LABORATORIES

BATH:

Public Health Laboratory, Manor Hospital, Combe Park
Tel.: Bath 7250

P. G. Mann, M.D., Dip. Bact. (*Director*)

BEDFORD:

Public Health Laboratory, General Hospital, Kimbolton Road
Tel.: Bedford 66896

W. F. Lane, M.B., M.Sc., D.P.H. (*Director*)
J. Marshall, F.I.M.L.T. (*Technical Officer*)

BIRMINGHAM:

Public Health Laboratory, 150, Great Charles Street
Tel.: Birmingham Central 6921/2

B. R. Sandiford, M.D. (*Director*)

BOURNEMOUTH:

Public Health Laboratory, Gloucester Road, Boscombe
Tel.: Bournemouth 37304

G. J. G. King, M.B., Dip. Bact. (*Director*)

BRADFORD:
Public Health Laboratory, 16–18, Edmund Street, Bradford, 5.
Tel.: Bradford 24314
H. G. M. Smith, M.B., Ph.D., Dip. Bact. (*Director*)
G. I. Barrow, M.D., Dip. Bact.*

BRIGHTON:
Public Health Laboratory, Royal Sussex County Hospital, Brighton, 7
Tel.: Brighton 63506
J. E. Jameson, M.R.C.S. (*Director*)

CARLISLE:
Public Health Laboratory, Cumberland Infirmary
Tel.: Carlisle 22332
D. G. Davies, M.D., Dip. Bact. (*Director*)

CARMARTHEN:
Public Health Laboratory, West Wales General Hospital, Glangwili
Tel.: Carmarthen 7271
H. D. S. Morgan, M.R.C.S., Dip. Bact. (*Director*)

CHELMSFORD:
Public Health Laboratory, Chelmsford and Essex Hospital, New London Road
Tel.: Chelmsford 55139
R. Pilsworth, M.D., Dip. Bact. (*Director*)

CHESTER:
Public Health Laboratory, Chester City Hospital, Hoole Lane
Tel.: Chester 21417
Miss P. M. Poole, M.D., B.A.O., Dip. Bact. (*Director*)
D. C. J. Bassett, M.B., Dip. Bact.

CONWAY:
Public Health Laboratory, " Bryn Hyfryd "
Tel.: Conway 2178
A. J. Kingsley Smith, B.M. (*Director*)
P. W. W. Griffiths, M.B., Dip. Bact.

COVENTRY:
Public Health Laboratory, Coventry and Warwickshire Hospital, Stoney Stanton Road
Tel.: Coventry 24055
J. E. M. Whitehead, M.B., Dip. Bact. (*Director*)

DERBY:
Public Health Laboratory, 121a, Osmaston Road
Tel.: Derby 45597
J. L. G. Iredale, M.B., D.P.H. (*Director*)

DORCHESTER:
Public Health Laboratory, Glyde Path Road
Tel.: Dorchester 1278
G. H. Tee, M.R.C.S., Ph.D. (*Director*)

EPSOM:
Public Health Laboratory, West Park Hospital
Tel.: Epsom 26633, 22474
D. R. Gamble, M.B., Dip. Bact. (*Director*)
Miss H. G. T. Maycock, M.R.C.S., D.C.P.
Miss E. I. Tanner, M.B., Dip. Bact.

EXETER:
Public Health Laboratory, Bradninch Place, Gandy Street
Tel.: Exeter 54959
B. Moore, M.D., B.Sc., B.A.O. (*Director*)
Miss L. Glover, Dip. Tech.
W. J. Ryan, M.B., D.P.H., Dip. Bact.

GUILDFORD:
Public Health Laboratory, St. Luke's Hospital
Tel.: Guildford 66091
G. T. Cook, M.D. (*Director*)

HEREFORD:
Public Health Laboratory, County Hospital
Tel.: Hereford 4696
D. R. Christie, M.B., Dip. Bact. (*Director*)

HULL:
Public Health Laboratory, 184, High Street
Tel.: Hull Central 28333
J. H. McCoy, M.B., D.P.H. (*Director*)

IPSWICH:
Public Health Laboratory, Woodbridge Road East
Tel.: Ipswich 77261/2
J. M. S. Dixon, M.D., Dip. Bact. (*Director*)

---

* To be Director of the Public Health Laboratory, Truro.

LEICESTER:
Public Health Laboratory,
Groby Road Hospital,
Tel.: Leicester 872283

N. S. Mair, M.B., D.C.H., D.P.H., Dip. Bact. (*Director*)
Mrs. H. J. Mair, M.D., Dip. Bact. (*part-time*)

LINCOLN:
Public Health Laboratory,
St. Anne's Road
Tel.: Lincoln 28607

J. M. Croll, M.B., D.P.H. (*Director*)

LONDON (County Hall):
Bacteriological Laboratory (P.H.L.S.),
Room 617, County Hall, Westminster Bridge, S.E.1.
Tel.: Waterloo 3467

A. J. H. Tomlinson, M.D. (*Director*)
Miss J. R. Davies, M.D., Dip. Bact. (*Deputy Director*)
C. H. Collins, F.I.M.L.T. (*Technical Officer*)

LUTON:
Public Health Laboratory, Luton and Dunstable Hospital, Lewsey Road
Tel.: Luton 52007

H. D. Holt, M.R.C.S., D.P.H., Dip. Bact. (*Director*)

MAIDSTONE:
Public Health Laboratory, Preston Hall, British Legion Village
Tel.: Maidstone 7239

A. L. Furniss, M.D., Dip. Bact. (*Director*)

MIDDLESBROUGH:
Public Health Laboratory, General Hospital, Ayresome Green Lane
Tel.: Middlesbrough 87766

A. R. Blowers, M.D., Dip. Bact. (*Director*)

NEWPORT (Mon.):
Public Health Laboratory, Clytha Square (Royal Gwent Hospital)
Tel.: Newport 63248

R. D. Gray, M.D., D.P.H. (*Director*)
G. H. Lowe, F.I.M.L.T. (*Technical Officer*)

NORTHALLERTON:
Public Health Laboratory,
The Friarage Hospital
Tel.: Northallerton 88

J. G. Wallace, B.M., D.C.P., Dip. Bact. (*Director*)

NORTHAMPTON:
Public Health Laboratory, General Hospital
Tel.: Northampton 34347

L. Hoyle, M.B. (*Director*)

NORWICH:
Public Health Laboratory, Bowthorpe Road
Tel.: Norwich 28145

Miss L. M. Dowsett, M.D. (*Director*)
T. D. F. Money, M.B., D.R.C.O.G. (*part-time*)

NOTTINGHAM:
Public Health Laboratory, 63, Goldsmith Street
Tel.: Nottingham 46436

E. R. Mitchell, M.B., Dip. Bact. (*Director*)

PETERBOROUGH:
Public Health Laboratory, Peterborough and District Memorial Hospital
Tel.: Peterborough 2277

E. J. G. Glencross, M.B., Dip. Bact. (*Director*)

PLYMOUTH:
Public Health Laboratory, South Devon and East Cornwall Hospital, Greenbank Road
Tel.: Plymouth 63997

C. H. Jellard, B.M., Dip. Bact. (*Director*)
Miss G. M. Churcher, M.B., Dip. Bact.

PORTSMOUTH:
Public Health Laboratory, Priorsdean Hospital, Milton Road
Tel.: Portsmouth 22331

D. J. H. Payne, M.B., Dip. Bact. (*Director*)
L. A. Hatch, M.B., Dip. Bact.
D. A. Skan, M.B.E., M.B., D.T.M. & H.

PRESTON:
Public Health Laboratory, Royal Infirmary, Meadow Street
Tel.: Preston 57886
L. Robertson, B.M., Dip. Bact. (*Director*)

READING:
Public Health Laboratory, Battle Hospital, Oxford Road
Tel.: Reading 52957
N. Wood, M.D., B.Sc. (*Director*)

SALISBURY:
Public Health Laboratory, General Infirmary
Tel.: Salisbury 3231
P. J. Wormald, M.D. (*Director*)

SHREWSBURY:
Public Health Laboratory, Royal Salop Infirmary
Tel.: Shrewsbury 4684/5
A. C. Jones, M.B. (*Director*)

SOUTHAMPTON:
Public Health Laboratory, General Hospital, Tremona Road
Tel.: Southampton 76177
Miss R. I. Hutchinson, M.D., D.P.H., D.T.M. (*Director*)
J. M. Graham, M.B., Dip. Bact.

SOUTHEND:
Public Health Laboratory, Westcliff Hospital, Balmoral Road
Tel.: Southend 45440
J. A. Rycroft, M.B., Dip. Bact. (*Director*)

STAFFORD:
Public Health Laboratory, Martin Street
Tel.: Stafford 4377
E. M. Mackay-Scollay, M.B., Dip. Bact. (*Director*)
A. E. Wright, M.D., D.P.H., Dip. Bact.

SUNDERLAND:
Public Health Laboratory, Havelock Hospital, Hylton Road
Tel.: Sunderland 56256
P. B. Crone, M.D., Dip. Bact. (*Director*)

SWANSEA:
Public Health Laboratory, Cockett Road
Tel.: Swansea 24041/2
W. Kwantes, M.B., Dip. Bact. (*Director*)
D. G. Fleck, M.D., Dip. Bact.

TAUNTON:
Public Health Laboratory, Musgrove Park Hospital
Tel.: Taunton 5753
J. A. Boycott, D.M. (*Director*)
F. A. J. Bridgwater, M.B., Dip. Bact.

TRURO:
Public Health Laboratory, Royal Cornwall Infirmary
Tel.: Truro 3029
F. D. M. Hocking, M.B., B.Sc. (*Acting Director to* 28 *August*, 1964)*

WAKEFIELD:
Public Health Laboratory, Wood Street
Tel.: Wakefield 2207
L. A. Little, M.B., Dip. Bact. (*Director*)
H. Fennell, B.Sc.

WATFORD:
Public Health Laboratory, Peace Memorial Hospital
Tel.: Watford 21369
Mrs. B. H. E. Cadness-Graves, M.B., M.Sc. (*Director, part-time*)

WINCHESTER:
Public Health Laboratory, Royal Hampshire County Hospital
Tel.: Winchester 3807
M. H. Hughes, D.M., D.T.M. & H., Dip. Bact. (*Director*)

WORCESTER:
Public Health Laboratory, Royal Infirmary
Tel.: Worcester 25238/9
R. J. Henderson, M.D. (*Director*)
W. L. Hooper, B.Sc., M.B., Dip. Bact.

---

* To be succeeded by Dr. G. I. Barrow.

Cross-Infection Reference Laboratory (*incorporating the Staphylococcus and Streptococcus Reference Laboratories*): Central Public Health Laboratory, Colindale Avenue, N.W.9.

Tel.: Colindale 7041

M. T. Parker, M.D., Dip. Bact. (*Director*)
Mrs. E. A. Hall Asheshov, M.Sc., Dip. Bact.
Miss M. P. Jevons, M.D., Dip. Bact.
Miss M. John, B.Sc.
W. R. Maxted, F.I.M.L.T. (*Senior Technical Officer*)
Mrs. S. Polakoff, M.B.
D. Kingston, M.A.*
O. M. Lidwell, D.Phil.* (*Deputy Director*)

Disinfection Reference Laboratory: Central Public Health Laboratory, Colindale Avenue, London, N.W.9.

Tel.: Colindale 7041

J. C. Kelsey, M.D., Dip. Bact. (*Director*)
Miss M. M. Pashley (Mrs. Beeby), B.Sc.

Dysentery Reference Laboratory: Central Public Health Laboratory, Colindale Avenue, London, N.W.9.

Tel.: Colindale 7041

Mrs. K. P. Carpenter, M.B., Dip. Bact. (*Director*)
Miss J. M. Hart, B.Sc.
Miss E. M. Illingworth, B.Sc.
Miss G. King, B.Sc.

Enteric Reference Laboratory: Central Public Health Laboratory, Colindale Avenue, London, N.W.9.

Tel.: Colindale 7041

E. S. Anderson, M.D., Dip. Bact. (*Director*)
Miss A. E. Gunnell, B.Sc.
Miss M. E. Thompson, B.Sc.

Mycological Reference Laboratory: London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C.1.

Tel.: Museum 3041

I. G. Murray, M.B., D.T.M. & H. (*Director*)
Miss C. Philpot, B.Sc.

Salmonella Reference Laboratory: Central Public Health Laboratory, Colindale Avenue, London, N.W.9.

Tel.: Colindale 7041

Mrs. J. Taylor, M.B., B.Sc., D.P.H. (*Director*)
K. A. Bettelheim, M.Sc., D.I.C.
S. P. Lapage, M.B., Dip. Bact. (*Deputy Director*)
Miss M. M. Lee (Mrs. Brooks), B.Sc.

Tuberculosis Reference Laboratory: Institute of Preventive Medicine, The Parade, Cardiff.

Tel.: Cardiff 30108

J. Marks, M.D., Dip. Bact. (*Director*)

Venereal Diseases Reference Laboratory: London Hospital Research Laboratories, Ashfield Street, London, E.1.

Tel.: Stepney Green 3008

A. E. Wilkinson, M.R.C.S. (*Director, part-time*)
C. S. Fry, B.A.
Miss N. A. Johnston, M.D., D.R.C.O.G. (*part-time*)

Virus Reference Laboratory: Central Public Health Laboratory, Colindale Avenue, London, N.W.9.

Tel.: Colindale 7041

A. D. Macrae, M.D., Dip. Bact. (*Director*)
Miss M. O. Adams (Mrs. Roebuck), M.B., Dip. Bact.
B. E. Andrews, M.R.C.S., Dip. Bact.
A. S. Beare, M.B., B.A.O., D.T.M. & H.
Miss Y. E. Cossart (Mrs. Wills), M.B.
Miss A. M. Field, B.Sc.
Miss S. D. Gardner, M.B., Dip. Bact.
Miss G. M. Grieve, B.Sc.
J. R. McDonald, F.I.M.L.T. (*Technical Officer*)
Mrs. M. S. Pereira, M.D.
Miss E. V. Williams, B.Sc.

---

* Members of the external scientific staff of the Medical Research Council.

SPECIAL LABORATORIES

Epidemiological Research Laboratory: Central Public Health Laboratory, Colindale Avenue, London, N.W.9.
Tel.: Colindale 7041

J. C. McDonald, M.D., D.P.H., D.I.H. (*Director*)*
Miss B. J. Kinsley, B.Sc.
D. L. Miller, M.B.
Mrs. C. S. Peckham, M.B.
R. V. Peters, M.B., D.P.H.
Mrs. E. D. Vernon, B.Sc.

Epidemiological Research Unit: 86, Dyer Street, Cirencester, Glos.
Tel.: Cirencester 745

R. E. Hope-Simpson, O.B.E., M.R.C.S. (*Director, part-time*)
P. G. Higgins, M.B., Dip. Bact.

Food Hygiene Laboratory: Central Public Health Laboratory, Colindale Avenue, London, N.W.9.
Tel.: Colindale 7041

Miss B. C. Hobbs, O.St.J., D.Sc., Dip. Bact., F.R.S.H. (*Director*)
A. C. Ghosh, B.Sc.

National Collection of Type Cultures: Central Public Health Laboratory, Colindale Avenue, London, N.W.9.
Tel.: Colindale 7041

S. T. Cowan, M.D., D.Sc., Dip. Bact. (*Curator*)
Miss J. Midgley, B.Sc.
Miss H. E. Ross, B.Sc.
K. J. Steel, B.Pharm., Ph.D. (*Deputy Curator*)

Standards Laboratory for Serological Reagents: Central Public Health Laboratory, Colindale Avenue, London, N.W.9.
Tel.: Colindale 7041

Mrs. C. M. P. Bradstreet, M.B., Dip. Bact. (*Director*)
Miss E. M. Bailey, B.Sc.
Mrs. M. W. Dighero, B.Sc.
Mrs. J. M. B. Edwards, M.B. (*part-time*
Miss A. J. Tannahill, B.Sc.

---

* Until 30th June, 1964: to be succeeded by T. M. Pollock, M.B.

JUNIOR BACTERIOLOGISTS IN TRAINING

(*Attending course at The London School of Hygiene and Tropical Medicine for Diploma in Bacteriology*, 1963–64.)

B. W. Barton, M.B.
A. A. Codd, M.B.
D. N. Hutchinson, M.B.
P. J. Sanderson, M.B., B.Sc.
J. A. Tooth, M.B.

STAFF ON SECONDMENT

P. Cavanagh, M.B., B.A.O. (*to the University of Khartoum, Sudan*)

A. E. Jephcott, B.A., M.B. (*to Wright-Fleming Institute of Microbiology, St. Mary's Hospital, Paddington, London, W.2*)

M. J. Lewis, M.B., Dip. Bact. (*to the Lister Institute for Preventive Medicine, Chelsea Bridge Road, London, S.W.1*)

D. Taylor-Robinson, M.D. (*to the Laboratory of Infectious Diseases, Bethesda, U.S.A.*)

J. S. Winchester, M.B. (*to St. George's Hospital Medical School, London, S.W.1*)

REFERENCE EXPERTS

In the following list the name of the expert who is responsible for the relevant examination is given. It should be added, however, that all regional and most area laboratories are undertaking the routine diagnosis of virus infections, and that several laboratories are undertaking the serological identification of members of the *Salmonella* group, the serological diagnosis of leptospiral infections, and the bacteriophage-typing of strains of *Staphylococcus aureus*. For this reason, enquiries on these subjects should usually be addressed to the local public health laboratory.

Anaerobes, identification

Professor C. L. Oakley, M.D., D.Sc., F.R.S., Bacteriology Department, School of Medicine, Leeds, 2. *Tel.:* Leeds 36171.

Anthrax bacilli, identification

A. J. H. Tomlinson, M.D., Bacteriological Laboratory (P.H.L.S.), Room 617, County Hall, London, S.E.1. *Tel.:* Waterloo 3467.

Arizona group, identification

Mrs. J. Taylor, M.B., B.Sc., D.P.H., Salmonella Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. *Tel.:* Colindale 7041.

Brucella, identification

D. J. H. Payne, M.B., Dip. Bact., Public Health Laboratory, Priorsdean Hospital, Milton Road, Portsmouth. *Tel.:* Portsmouth 22331.

Clostridium welchii, serological typing

Miss B. C. Hobbs, D.Sc., Dip. Bact., F.R.S.H., Food Hygiene Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. *Tel.:* Colindale 7041.

Coxsackie A viruses

D. R. Gamble, M.B., Dip. Bact., Public Health Laboratory, West Park Hospital, Epsom. *Tel.:* Epsom 5241.

Diphtheria bacilli, serological typing

Professor D. T. Robinson, M.Sc., M.R.C.S., Dip. Bact., Public Health Laboratory, 126, Mount Pleasant, Liverpool, 3. *Tel.:* Liverpool Royal 3636/7.

Disinfection

J. C. Kelsey, M.D., Dip. Bact., Disinfection Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. *Tel.:* Colindale 7041.

Dysentery, amoebic, complement-fixation test for

Mrs. C. M. P. Bradstreet, M.B., Dip. Bact., Standards Laboratory for Serological Reagents, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. *Tel.:* Colindale 7041.

Dysentery bacilli, typing

Mrs. K. P. Carpenter, M.B., Dip. Bact., Dysentery Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. *Tel.:* Colindale 7041.

Encephalitis, acute infectious

A. D. Macrae, M.D., Dip. Bact., Virus Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. *Tel.:* Colindale 7041.

Enteric Fever

(*a*) Serological investigation of suspected cases and carriers.

(*b*) Phage-type determination of strains of typhoid and paratyphoid bacilli, and of *Salmonella typhi-murium* and other salmonella serotypes.

E. S. Anderson, M.D., Dip. Bact., Enteric Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. *Tel.:* Colindale 7041.

Enteritis, infantile, typing of strains of *Esch. coli*

Mrs. J. Taylor, M.B., B.Sc., D.P.H., Salmonella Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. *Tel.:* Colindale 7041.

Entomological specimens, investigation

B. R. Laurence, Ph.D., Department of Entomology, London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C.1. *Tel.:* Museum 3041.

*Food Poisoning**

Miss B. C. Hobbs, D.Sc., Dip. Bact., F.R.S.H., Food Hygiene Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. *Tel.:* Colindale 7041.

Fungi (pathogenic), identification

I. G. Murray, M.B., D.T.M. & H., Mycological Reference Laboratory, London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C.1. *Tel.:* Museum 3041.

Helminthological specimens, investigation

Professor J. J. C. Buckley, D.Sc., London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C.1. *Tel.:* Museum 3041.

Hydatid disease, complement-fixation test for

Mrs. C. M. P. Bradstreet, M.B., Dip. Bact., Standards Laboratory for Serological Reagents, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. *Tel.:* Colindale 7041.

---

* Owing to the perishable nature of most foodstuffs, material for investigation from outbreaks of food poisoning should normally be sent to the nearest public health laboratory. The reference laboratory should be used mainly for non-perishable articles of food, especially when litigation may arise, and for the identification of strains.

Influenza

L. Hoyle, M.B., Public Health Laboratory, General Hospital, Northampton. *Tel.:* Northampton 34347.

Leptospiral infections, agglutination tests

L. H. Turner, M.B.E., M.D., D.T.M. & H., Wellcome Laboratories of Tropical Medicine, 183, Euston Road, London, N.W.1. *Tel.:* Euston 4688.

Lymphocytic meningitis
Lymphogranuloma venereum

A. D. Macrae, M.D., Dip. Bact., Virus Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. *Tel.:* Colindale 7041.

Meningococci, typing

Mrs. C. M. P. Bradstreet, M.B., Dip. Bact., Standards Laboratory for Serological Reagents, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. *Tel.:* Colindale 7041.

Parasitic infections, serological diagnosis of

D. S. Ridley, B.Sc., M.D., Department of Pathology, Hospital for Tropical Diseases, 4, St. Pancras Way, London, N.W.1. *Tel.:* Euston 6441.

Plague, investigation

R. J. Henderson, M.D., Public Health Laboratory, Royal Infirmary, Worcester. *Tel.:* Worcester 25238/9.

Pneumococci, typing of from epidemics

M. T. Parker, M.D., Dip. Bact., Cross-Infection Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. *Tel.:* Colindale 7041.

Poliomyelitis

A. D. Macrae, M.D., Dip.Bact., Virus Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. *Tel.:* Colindale 7041.

Protozoological specimens, investigation

Professor P. C. C. Garnham, M.D., D.Sc., London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C.1. *Tel.:* Museum 3041.

Psittacosis, diagnosis

A. D. Macrae, M.D., Dip. Bact., Virus Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. *Tel.:* Colindale 7041.

Rabies, laboratory tests for diagnosis

Virus Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. *Tel.:* Colindale 7041.

Salmonella organisms, typing

Mrs. J. Taylor, M.B., B.Sc., D.P.H., Salmonella Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. *Tel.:* Colindale 7041.

Smallpox, laboratory tests for diagnosis

Professor A. W. Downie, M.D., D.Sc., F.R.S., Bacteriology Department, Medical School, Ashton Street, Liverpool, 3. *Tel.:* Royal 7983 and Royal 6022, Ext. 202.

J. H. Hale, O.B.E., M.D., M.R.C.P., Public Health Laboratory, Institute of Pathology, General Hospital, Westgate Road, Newcastle upon Tyne, 4. *Tel.:* Newcastle 38811, Ext. 297.

A. D. Macrae, M.D., Dip. Bact., Virus Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. *Tel.:* Colindale 7041.

Professor Scott Thomson, M.D., F.R.C.P.E., D.P.H., Public Health Laboratory, Institute of Pathology, 3rd Floor, Royal Infirmary, Cardiff. *Tel.:* Cardiff 24385.

Staphylococci, bacteriophage-typing

M. T. Parker, M.D., Dip. Bact., Cross-Infection Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. *Tel.:* Colindale 7041.

Streptococci of Group A, typing

M. T. Parker, M.D., Dip.Bact., Cross-Infection Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. *Tel.:* Colindale 7041.

Regional Typing Laboratories

(i) *Northern and South Eastern counties:* Cumberland, Co. Durham, Lancs., Northumberland, Westmorland, Yorks.; Dorset, Hants., Kent, London, Middx., Surrey, Sussex.

M. T. Parker, M.D., Dip.Bact., Cross-Infection Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. *Tel.:* Colindale 7041.

(ii) *Eastern counties:* Beds., Cambs., Derby, Essex, Herts., Hunts., Leics., Lincs., Norfolk, Northants., Notts., Rutland, Suffolk.

Miss J. M. Boissard, M.R.C.S., Public Health Laboratory, Tennis Court Road, Cambridge. *Tel.:* Cambridge 55526.

(iii) *Western counties:* Berks, Bucks., Cheshire, Cornwall, Devon, Glos., Heref., Oxon., Salop., Somerset, Staffs, Warw., Wilts., Worcs.

R. L. Vollum, D.Phil., Public Health Laboratory, Radcliffe Infirmary, Oxford. *Tel.:* Oxford 49231/2.

(iv) *Wales.*

Professor Scott Thomson, M.D., F.R.C.P.E., D.P.H., Public Health Laboratory, Institute of Pathology, 3rd Floor, Royal Infirmary, Cardiff. *Tel.:* Cardiff 24385.

Toxoplasmosis

North

G. B. Ludlam, M.D., D.T.M. & H., D.L.O., Public Health Laboratory, Bridle Path, York Road, Leeds, 15. *Tel.:* Leeds 645011.

South

D. G. Fleck, M.D., Dip. Bact., Public Health Laboratory, Cockett Road, Swansea. *Tel.:* Swansea 24041/2.

Trichinosis, examination of rats and pigs

Professor J. J. C. Buckley, D.Sc., London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C.1. *Tel.:* Museum 3041.

Tubercle bacilli, typing

J. Marks, M.D., M.R.C.P., Dip. Bact., Tuberculosis Reference Laboratory, Institute of Preventive Medicine, The Parade, Cardiff. *Tel.:* Cardiff 30108.

Typhus Fever, serological tests*

Virus Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. *Tel.:* Colindale 7041.

Venereal diseases

A. E. Wilkinson, M.R.C.S., Venereal Diseases Reference Laboratory, London Hospital Research Laboratories, Ashfield Street, London, E.1. *Tel.:* Stepney Green 3008.

Venereal diseases, Treponemal immobilisation test

A. E. Wilkinson, M.R.C.S., Venereal Diseases Reference Laboratory, London Hospital Research Laboratories, Ashfield Street, London, E.1. *Tel.:* Stepney Green 3008.

Midlands

P. J. L. Sequeira, M.B., The Central Serological Laboratory, Withington Hospital, West Didsbury, Manchester, 20. *Tel.:* Didsbury 8111.

North

J. H. Hale, O.B.E., M.D., M.R.C.P., Public Health Laboratory, Institute of Pathology, General Hospital, Westgate Road, Newcastle upon Tyne, 4. *Tel.:* Newcastle 38811, Ext. 297.

Viruses, material from infections other than those mentioned

A. D. Macrae, M.D., Dip. Bact., Virus Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, N.W.9. *Tel.:* Colindale 7041.

---

* The Weil-Felix test can be carried out in all constituent laboratories of the Service, and also in a number of hospital laboratories. Only sera giving a doubtful reaction should be sent to the Virus Reference Laboratory.

VACCINES AND SERA OBTAINABLE THROUGH THE PUBLIC HEALTH LABORATORY SERVICE

(These reagents are issued free of charge to medical officers of health and to general practitioners taking part in Local Health Authorities' arrangements made under Section 26 of the National Health Service Act)

Laboratory (For address see pp. 17–23)	Smallpox *Vaccine	Typhus Vaccine	Rabies Vaccine
Birmingham	+	+	—
Bristol	+	+	—
Cambridge	+	+	—
Carlisle	+	—	—
Derby	+	—	—
Dorchester	+	—	—
Exeter	+	+	—
Hereford	+	—	—
Ipswich	+	—	—
Leeds	+	+	—
Leicester	+	—	—
Lincoln	+	—	—
Liverpool	+	+	+
London (Colindale)	+	+	+
Maidstone	+	—	—
Manchester	+	+	—
Newcastle	+	+	+
Northallerton	+	—	—
Northampton	+	—	—
Norwich	+	—	—
Oxford	+	+	—
Preston	+	—	—
Sheffield	+	+	—
Stafford	+	—	—
Wakefield	+	—	—
Winchester	+	—	—
Cardiff (*a*)	+	+	+
Carmarthen	+	—	—
Conway	+	—	—

+means that a stock is normally held. —means that a stock is not normally held.

NOTE 1.—Antisera for *therapeutic* use are obtainable through the Hospital Pathological Service.

„ 2.—*Gamma globulin* prepared from the pooled plasma of normal healthy adults is obtainable on request from any laboratory of the Service. So far as supplies allow, it is issued for the protection of susceptible contacts of measles, rubella, infectious hepatitis and poliomyelitis.

In addition to normal gamma globulin, a stock of gamma globulin prepared from the blood of persons recently vaccinated against smallpox is held for the treatment of cases of generalised vaccinia, eczema vaccinatum, accidental vaccinial infections endangering the eye, and, in special circumstances, for the protection of unvaccinated smallpox contacts. This anti-vaccinial gamma globulin may be obtained from any of the regional laboratories (pp. 17–18) and from Birmingham (p. 18) as well as from Colindale.

„ 3.—*Yellow fever:* A list of centres where inoculation against this disease can be carried out is obtainable from the Ministry of Health, Alexander Fleming House, Elephant & Castle, London, S.E.1.

„ 4.—*T.A.B.C., cholera, and most other vaccines* are available commercially.

„ 5.—*Material for intradermal diagnostic tests:* Frei antigen for Lymphogranuloma inguinale, Brucellin for Undulant fever, Trichina antigen for Trichinosis, Hydatid antigen for Hydatid disease, and cat-scratch fever antigen can be obtained from

---

* In addition to the laboratories named officially below, many laboratories carry small supplies for the convenience of local medical practitioners.

NOTE 5.—*contd.*

Dr. C. M. Patricia Bradstreet, Standards Laboratory for Serological Reagents, Central Public Health Laboratory, Colindale Avenue, London N.W.9 (*Tel.* Colindale 7041). Kveim antigen for Sarcoidosis may also be obtained, through any pathologist, from the Standards Laboratory. Histoplasmin and coccidioidin antigen for diagnostic skin tests may be obtained from the Department of Pathology, St. John's Hospital for Diseases of the Skin, Lisle Street, London, W.C.2 (*Tel.* Gerrard 8383, Ext. 22). Blastomycosis antigen is obtainable commercially from Messrs. Parke Davis & Co., Staines Road, Hounslow, Middlesex (*Tel.* Hounslow 2361).

„ 6.—Certain *reagents for the diagnosis of venereal disease* can be obtained from Dr. A. E. Wilkinson at the Venereal Diseases Reference Laboratory, London Hospital Research Laboratories, Ashfield Street, London, E.1 (*Tel.* Stepney Green 3008).

APPENDIX I

PRINCIPAL COMMITTEES AND WORKING PARTIES

Food Investigation

J. H. McCoy, M.B., D.P.H. (*Chairman*)
N. S. Galbraith, M.B., D.P.H. (*Secretary*)

E. S. Anderson, M.D., Dip. Bact.
R. W. S. Harvey, M.B., Dip. Bact.
Miss B. C. Hobbs, D.Sc., Dip. Bact., F.R.S.H.
W. Kwantes, M.B., Dip. Bact.
H. D. S. Morgan, M.R.C.S., Dip. Bact.
Professor D. T. Robinson, M.Sc., M.R.C.S., Dip. Bact.
H. G. M. Smith, M.B., Ph.D., Dip. Bact.
Mrs. J. Taylor, M.B., B.Sc., D.P.H.
A. J. H. Tomlinson, M.D.
M. Ingram, M.A., Ph.D. (*Low Temperature Research Station*)
J. Greenwood Wilson, M.D., D.P.H., F.R.C.P. (*M.O.H., Port and City of London*)
S. Brightwell, M.Sc., D.I.C., A.R.I.C. (*Messrs. J. Sainsbury, Ltd., to give technical advice on trade matters*)

Cross-Infection in Hospitals

(*a*) *Autopsy Survey of Staphylococcal Infection* (*Steering Committee*)

M. T. Parker, M.D., Dip. Bact. (*Chairman*)
B. Moore, M.D., B.Sc. (*Secretary*)

H. R. Cayton, M.B.
R. J. Henderson, M.D.
J. C. McDonald, M.D., D.P.H., D.I.H.
K. E. A. Hughes, M.B.E., M.R.C.S.
Professor R. E. O. Williams, M.D., M.R.C.P. (*St. Mary's Hospital Medical School*)

(*b*) *Survey of Hospital-Acquired Infection in Medical Wards* (*Steering Committee*)

M. T. Parker, M.D., Dip. Bact. (*Chairman*)
A. R. Blowers, M.D., Dip. Bact. (*Secretary*)

J. A. Boycott, D.M.
R. J. Henderson, M.D.
H. D. S. Morgan, M.R.C.S., Dip. Bact.

In addition to the members of the Steering Committees, a number of laboratories are taking part in one or other or both surveys.

Problems Relating to the Testing and Evaluation of Disinfectants

J. W. Howie, M.D., F.R.C.P (*Chairman*)
J. C. Kelsey, M.D., Dip. Bact. (*Secretary*)

R. J. Henderson, M.D.
A. H. Tomlinson, D.Phil.
Sir Graham Wilson, M.D., F.R.C.P., D.P.H., LL.D.
A. M. Cook, Ph.D., F.P.S., F.R.I.C. (*School of Pharmacy, University of London*)
H. Davis, C.B.E., Ph.D., F.P.S., F.R.I.C. (*Chief Pharmacist, Ministry of Health*)
Professor L. P. Garrod, M.D., F.R.C.P.
G. Sykes, M.Sc., F.R.I.C. (*Chief Bacteriologist to Messrs. Boots*)

Bacteriological Examination of Watercress

G. H. Tee, Ph.D., M.R.C.S. (*Chairman*)
A. L. Furniss, M.D., Dip. Bact. (*Secretary*)

G. T. Cook, M.D.
J. M. Croll, M.B., D.P.H.
Miss B. C. Hobbs, D.Sc., Dip. Bact., F.R.S.H.
H. D. Holt, M.R.C.S., D.P.H., Dip. Bact.
W. H. H. Jebb, M.D., Barrister-at-Law.
G. J. G. King, M.B., Dip. Bact.
B. R. Sandiford, M.D.
K. E. A. Hughes, M.B.E., M.R.C.S.
J. F. E. Bloss, M.R.C.S., D.P.H. (*Ministry of Health*)
C. A. Scarlett, B.Sc., F.R.I.C. (*Ministry of Agriculture, Fisheries and Food*)
A. F. Gardner, Dip. Hort. (*Wye*) (*Ministry of Agriculture, Fisheries and Food*)
J. Jesty (*Messrs. Bedford and Jesty, Ltd., to give technical advice on trade matters*)

Working Party on Epidemic Non-Bacterial Gastro-Enteritis

B. Moore, M.D., B.Sc. (*Chairman*)
Miss S. K. R. Clarke, M.D. (*Secretary*)

G. T. Cook, M.D.
M. H. Hughes, D.M., D.T.M. & H., Dip. Bact.
J. E. Jameson, M.R.C.S.
A. D. Macrae, M.D., Dip. Bact.
E. R. Mitchell, M.B., Dip. Bact.
T. D. F. Money, M.B., D.R.C.O.G.
R. V. Peters, M.B., D.P.H.
L. Robertson, B.M., Dip. Bact.
J. O'H. Tobin, B.M., Dip. Bact.
J. E. M. Whitehead, M.B., Dip. Bact.
N. Wood, M.D., B.Sc.
P. Henderson, M.D., D.P.H. (*Ministry of Education*)
A. T. Roden, M.D., D.P.H. (*Ministry of Health*)

Working Party on Brucellosis

D. J. H. Payne, M.B., Dip. Bact. (*Chairman*)
(*Secretary*)

J. A. Boycott, D.M.
E. M. Mackay-Scollay, M.B., Dip. Bact.
P. G. Mann, M.D., Dip. Bact.
Miss P. M. Poole, M.D., B.A.O., Dip. Bact.
L. Robertson, B.M., Dip. Bact.

Joint Veterinary and Public Health Laboratory Services Working Party on Salmonellosis

Veterinary Service

D. W. Menzies, M.R.C.V.S. (*Chairman*)
D. R. Allen, M.R.C.V.S.
N. H. Brooksbank, B.Sc., M.R.C.V.S.
H. I. Field, M.Sc., M.R.C.V.S.
I. H. Fincham, M.R.C.V.S.
E. A. Gibson, Ph.D., B.Sc.(Vet.), M.R.C.V.S.
G. B. S. Heath, B.Sc. (Edin.), F.R.C.V.S.
R. M. Loosmore, B.V.Sc., M.R.C.V.S.
W. B. V. Sinclair, M.R.C.V.S.
W. J. Sojka, M.R.C.V.S.
J. A. J. Ven, M.R.C.V.S., D.V.S.M. (Vict.)

P.H.L.S.

R. W. S. Harvey, M.B., Dip. Bact. (*Secretary*)
E. S. Anderson, M.D., Dip. Bact.
J. A. Boycott, D.M.
D. G. Davies, M.D., Dip. Bact.
Miss B. C. Hobbs, D.Sc., Dip. Bact., F.R.S.H.
G. B. Ludlam, M.D., D.T.M. & H., D.L.O.
J. H. McCoy, M.B., D.P.H.
B. Moore, M.D., B.Sc.
Mrs. J. Taylor, M.B., B.Sc., D.P.H.
P. J. Wormald, M.D.

APPENDIX II

PUBLICATIONS BY MEMBERS OF THE STAFF OF THE PUBLIC HEALTH LABORATORY SERVICE DURING 1963

Adams, Mary O., Thompson, K. M. and Tobin, J. O'H.

Respiratory syncytial virus infection in the north west of England. *Arch. ges. Virusforsch.*, 1963, **13,** 268.

Anderson, E. S. and Rogers, A. H.

Slime polysaccharides of the enterobacteriaceae. [Letter] *Nature, Lond.*, 1963, **198,** 714.

Angel, J. H., Bhatia, A. L., Devadatta, S., Fox, W., Janardhanam, B., Radhakrishna, S., Ramakrishnan, C. V., Selkon, J. B., Stott, H. and Velu, S.

A controlled comparison of cycloserine plus ethionamide with cycloserine plus thiacetazone in patients with active pulmonary tuberculosis despite prolonged previous chemotherapy. *Tubercle, Lond.*, 1963, **44,** 215.

Asheshov, Elizabeth A. and Jevons, M. P.

The effect of heat on the ability of a host strain to support the growth of a staphylococcus phage. *J. gen. Microbiol.*, 1963, **31,** 97.

Barrow, G. I.

Microbial antagonism by *Staphylococcus aureus*. *J. gen. Microbiol.*, 1963, **31,** 471.
The nature of inhibitory activity by *Staphylococcus aureus* type 71. *Ibid.*, 1963, **32,** 255.

Bartram, H. G., Bothwell, P. W., Jebb, W. H. H., McDiarmid, A. and Preston, A. E.

Brucella abortus agglutinins in the sera of pregnant women and blood donors. *Brit. J. prev. soc. Med.* 1963, **17,** 95.

Bassett, H. F. M., Ferguson, W. G., Hoffman, E., Walton, M., Blowers, R. and Conn, C. A.

Sources of staphylococcal infection in surgical wound sepsis. *J. Hyg., Camb.*, 1963, **61,** 83.

Bernstein, A.

Temperature-dependent variation in the Vi-typing reactions of strains of *Salmonella typhi*. [Letter] *Nature, Lond.*, 1963, **197,** 101.

Bernstein, A. and Wilson, E. M. J.

An analysis of the Vi-phage typing scheme for *Salmonella typhi*. *J. gen. Microbiol.*, 1963, **32,** 349.

Bettelheim, K. A. and Gay, J. L.

Acetate-glyoxylate medium for the sporulation of *Saccharomyces cerevisiae*. *J. appl. Bact.*, 1963, **26,** 224.

Blowers, R.

Operating-room practice. In: *Infection in hospitals: epidemiology and control, a symposium organized by C.I.O.M.S.* Edited by R. E. O. Williams and R. A. Shooter. Oxford, Blackwell Scientific Publications, 1963, p. 199.

Blowers, R., Lidwell, O. M. and Williams, R. E. O.

Design and ventilation of operating-room suites for control of infection and for comfort. [Letter] *Lancet*, 1963, i, 165.

Bowie, J. H., Kelsey, J. C. and Thompson, G. R.

The Bowie and Dick autoclave tape test. *Lancet*, 1963, i, 586, and [Letter] 1215.

Brett, G. Z., McDonald, J. C. and Taylor, C. E. D.

Pneumonitis in north London: an epidemiological and serological study. *Brit. J. Dis. Chest*, 1963, **57,** 65.

Chanock, R. M., Dienes, L., Eaton, M. D., Edward, D. G. ff., Freundt, E. A., Hayflick, L., Hers, J. F. P., Jensen, K. E., Liu, C., Marmion, B. P., Morton, H. E., Mufson, M. A., Smith, P. F., Somerson, N. L. and Taylor-Robinson, D.

Mycoplasma pneumoniae: proposed nomenclature for atypical pneumonia organism (Eaton agent). *Science*, 1963, **140**, 662.

Clayton, Yvonne M. and Noble, W. C.

The air-borne spread of dermatophytes and *Candida albicans*. *Trans. St. John's Hosp. derm. Soc., Lond.*, 1963, **49**, 36.

Collins, C. H. and Massey, M. L.

The laboratory diagnosis of mycobacterial infections. In: *Progress in medical laboratory technique.* 2. Edited by F. J. Baker. London, Butterworths, 1963, p. 82.

Cowan, S. T.

Comment on virus taxonomy proposals. [Letter] *Int. Bull. bact. Nomencl.*, 1963, **13**, 223.

Culture collections, why and wherefore. [Discussion] In: *Culture collections: perspectives and problems.* Edited by S. M. Martin. Toronto, University of Toronto Press, 1963, p. 17.

Cowlard, J. H. and Thomas, M.

Tracing a salmonella epidemic to its source: circumstantial evidence and laboratory proofs in a community outbreak of gastro-enteritis due to *S. typhimurium* phage type 1a. *Sanitarian, Lond.*, 1963, **72**, 181.

Crone, P. B.

The use of resected lesions of the lung for comparing methods of isolating tubercle bacilli. *Mon. Bull. Minist. Hlth Lab. Serv.*, 1963, **22**, 40.

Crone, P. B. and Gee, B.

Counting of tubercle bacilli. *Mon. Bull. Minist. Hlth Lab. Serv.*, 1963, **22**, 44.

Darmady, E. M., Hughes, K. E. A. and Tuke, W.

Instrument container for dry-heat sterilisation. *Lancet*, 1963, ii, 498.

Dixon, J. M. S. and Paulley, J. W.

Bacteriological and histological studies of the small intestine of rats treated with mecamylamine. *Gut*, 1963, **4**, 169.

Essex-Cater, A. J., Jones, D. M. and Swindell, F.

An outbreak of human infection due to *Salmonella typhi-murium*, phage type 4, associated with the use of unpasteurised liquid egg. *J. Hyg., Camb.*, 1963, **61**, 323.

Evans, A. D.

Q fever. *Practitioner*, 1963, **191**, 605.

Rickettsial endocarditis. [Letter] *Brit. med. J.*, 1963, i, 1613.

Evans, A. D., Powell, D. E. B. and Burrell, C. D.

Rickettsial endocarditis. [Letter] *Brit. med. J.*, 1963, i, 1614.

Evans, D. G. and Smith, J. W. G.

Response of the young infant to active immunisation. *Brit. med. Bull.*, 1963, **19**, 225.

Field, Anne M. and Tanner, E. I.

The complement-fixing antibody response after vaccination with live attenuated poliovaccine. *Mon. Bull. Minist. Hlth Lab. Serv.*, 1963, **22**, 22.

Fisher, P. J.

The effect of freeze drying on the viability of *Chromobacterium lividum*. *J. appl. Bact.*, 1963, **26**, 502.

Fleck, D. G.

Antibodies of *Toxoplasma gondii*. *J. Hyg., Camb.*, 1963, **61**, 53.

Epidemiology of toxoplasmosis. *Ibid.*, 1963, **61**, 61.

Toxoplasmosis and lymphadenitis. [Letter] *Lancet*, 1963, i, 390.

Fleck, D. G. and Payne, R. A.

Tests for toxoplasma antibody. *Mon. Bull. Minist. Hlth Lab. Serv.*, 1963, **22**, 97.

Flewett, T. H., Warin, R. P. and Clarke, S. K. R.

' Hand, foot and mouth disease ' associated with Coxsackie A5 virus. *J. clin. Path.*, 1963, **16**, 53.

Fourman, P., Davis, R. H., Jones, K. H., Morgan, D. B. and Smith, J. W. G.
Parathyroid insufficiency after thyroidectomy: review of 46 patients, with a study of the effects of hypocalcaemia on the electro-encephalogram. *Brit. J. Surg.*, 1963, **50**, 608.

Fry, C. S. and Wilkinson, A. E.
A note on the use of Evans blue as a background stain in the fluorescent treponemal antibody test. *Brit. J. vener. Dis.*, 1963, **39**, 190.

Galbraith, N. S. and Cockburn, W. C.
Deaths from whooping cough in England and Wales in 1960 and 1961. *Mon. Bull. Minist. Hlth Lab. Serv.*, 1963, **22**, 54.

Gamble, D. R and Kinsley, M. L.
The routine typing of Coxsackie viruses by complement fixation. *Mon. Bull. Minist. Hlth Lab. Serv.*, 1963, **22**, 6.

Gillespie, E. H.
Bacterial examination of ice cream. *R.C. Ist. sup. Sanit.*, 1963, **26**, 482.

Goodburn, Gillian M., Marmion, B. P. and Kendall, E. J. C.
Infection with Eaton's primary atypical pneumonia agent in England. *Brit. med. J.*, 1963, i, 1266.

Greaves, R. I. N., Nagington, J. and Kellaway, T. D.
Preservation of living cells by freezing and by drying. *Fed. Proc.*, 1963, **22**, 90.

Griffith, A. H., Marks, J. and Richards, M.
Low-grade sensitivity to tuberculin in school children. *Tubercle, Lond.*, 1963, **44**, 135.

Hambling, M. H.
The respiratory syncytial virus. *University of London, M.D. Thesis*, 1963.

Hambling, M. H., Davis, P. M. and Macrae, A. D.
The typing of enteroviruses in tissue culture by neutralization with composite antiserum pools. *J. Hyg., Camb.*, 1963, **61**, 479.

Harvey, R. W. S., Price, T. H., Bate, W. and Allen, D. R.
An outbreak of food poisoning caused by *Salmonella typhi-murium*, phage-type 12, probably spread by infected meat. *J. Hyg., Camb.*, 1963, **61**, 419.

Henderson, R. J. and Williams, R. E. O.
Nasal carriage of staphylococci and post-operative staphylococcal wound infection. *J. clin. Path.*, 1963, **16**, 452.

Higgins, P. G., Ellis, E. M. and Boston, D. G.
The isolation of viruses from acute respiratory infections: a study of the isolations made from cases occurring in a general practice in 1962. *Mon. Bull. Minist. Hlth Lab. Serv.*, 1963, **22**, 71.

Hill, M. J.
A physical and chemical study of some strains of group A streptococci. *University of London, Ph.D. Thesis*, 1963.

Hill, M. J., James, A. M. and Maxted, W. R.
Some physical investigations of the behaviour of bacterial surfaces. 8. Studies on the capsular material of *Streptococcus pyogenes*. *Biochim. biophys. Acta*, 1963, **66**, 264.

Some physical investigations of the behaviour of bacterial surfaces. 9. Studies on the streptococcal cell wall. 10. The occurrence of lipid in the streptococcal cell wall. *Ibid.*, 1963, **75**, 402 and 414.

The use of specific amino acid decarboxylases for the identification of C-terminal groups. *Ibid.*, 1963, **71**, 740.

Hobbs, Betty C.
Microbiological standards for certain frozen foods. *R.C. Ist. sup. Sanit.*, 1963, **26**, 498.

Public health and poultry products. [Discussion] *Brit. vet. J.*, 1963, **119**, 120.

Salmonellae. In: *Chemical and biological hazards in foods.* Edited by J. C. Ayres, *et al.* Ames, Iowa, Iowa State University Press, 1963, p. 224.

Salmonellae in foods and animal feeding stuffs. *Int. atom. Energy Ag. tech. Rep. Ser.*, 1963, No. 22, p. 35.

Techniques for the isolation of salmonellae from eggs and egg-products. *Ann. Inst. Pasteur*, 1963, **104**, 621.

Hobbs, Betty C. and McLintock, J. S.
Hygienic food handling. London, The St. John Ambulance Association, 1962.

Holzel, A., Parker, L., Patterson, W. H., White, L. L. R., Thompson, K. M. and Tobin, J. O'H.
The isolation of respiratory syncytial virus from children with acute respiratory disease. *Lancet*, 1963, i, 295.

Howie, J. W. and Kelsey, J. C.
Bottled sterile water for operating theatres. [Letter] *Brit. med. J.*, 1963, i, 187, and *Lancet*, 1963, i, 165.

Hoyle, L.
The entry of myxoviruses into the cell. *Cold Spr. Harb. Symp. quant. Biol.*, 1962, **27,** 113.

Hughes, K. E. A.
A report on the efficiency of certain equipment for sterilising water for topical use. *Résumé V Mtg Cent. Sterilising Club*, Sunderland, 1963, p. 55.

Hughes, M. H.
Dispersal of bacteria on desquamated skin. [Letter] *Lancet*, 1963, i, 109.

Jacobs, S. I., Willis, A. T., Ludlam, G. B. and Goodburn, G. M.
Studies on newly recognised strains of *Staphylococcus aureus* associated with hospital infection. *Lancet*, 1963, i, 972.

Jameson, J. E.
A note on the isolation of salmonellae. *J. appl. Bact.*, 1963, **26,** 112.

Jevons, M. Patricia, Coe, A. W. and Parker, M. T.
Methicillin resistance in staphylococci. *Lancet*, 1963, i, 904.

Kelsey, J. C.
Sterile supply—sterilizing methods. In: *Infection in hospitals: epidemiology and control, a symposium organized by C.I.O.M.S.* Edited by R. E. O. Williams and R. A. Shooter. Oxford, Blackwell Scientific Publications, 1963, p. 279.
Sterilizing procedures for heart-lung machines. *J. clin. Path.*, 1963, **16,** 542.

King, A. J. and Wilkinson, A. E.
Ivor Noble Orpwood Price, 1 January 1900—6 December 1962. *J. Path. Bact.*, 1963, **86,** 545.

Kingston, D.
Tests on dry, oiled and damp mops. *Mon. Bull. Minist. Hlth Lab. Serv.*, 1963, **22,** 153.

Knox, W. A., Galbraith, N. S., Lewis, M. J., Hickie, G. C. and Johnston, H. H.
A milk-borne outbreak of food poisoning due to Salmonella heidelberg. *J. Hyg., Camb.*, 1963, **61,** 175.

Lane, W. F., Marshall, J. and Mair, H. J.
Comparison of heated and unheated serum for the culture of human amnion cells. *Mon. Bull. Minist. Hlth Lab. Serv.*, 1963, **22,** 215.

Ley, F. J., Freeman, B. M. and Hobbs, B. C.
The use of gamma radiation for the elimination of salmonellae from various foods. *J. Hyg., Camb.*, 1963, **61,** 515.

Lidwell, O. M.
Methods of investigation and analysis of results. In: *Infection in hospitals: epidemiology and control, a symposium organized by C.I.O.M.S.* Edited by R. E. O. Williams and R. A. Shooter. Oxford, Blackwell Scientific Publications, 1963, p. 43.

Ludlam, G. B. and Beattie, C. P.
Pulmonary toxoplasmosis. *Lancet*, 1963, ii, 1136.

McCoy, J. H.
River pollution: bacteriological aspects and their significance. *R. Soc. Hlth J.*, 1963, **83,** 154.
Salmonellae in crude sewage, sewage effluent and sewage-polluted natural waters. *Int. J. Air Wat. Pollut.*, 1963, **7,** 597.

McDonald, J. C.
Adenovirus disease and its epidemiology. *Trans. ophthal. Soc., U.K.*, 1962, **82,** 607.
Gamma-globulin for prevention of rubella in pregnancy. *Brit. med. J.*, 1963, ii, 416.
The importance of respiratory viral diseases in western Europe. *Amer. Rev. resp. Dis.*, 1963, **88,** No. 3 ii, p. 35.

MAIR, Hélène J.
Aseptic meningitis due to Frater virus. *Mon. Bull. Minist. Hlth Lab. Serv.*, 1963, **22,** 119.

MAIR, N. S. and HARBOURNE, J. F.
The isolation of *Pasteurella pseudotuberculosis* from a bovine foetus. *Vet. Rec.*, 1963, **75,** 559.

MARKS, J.
Disseminated B.C.G. infection. [Letter] *Brit. med. J.*, 1963, i, 1737.
Pyruvic acid in the cultivation of tubercle bacilli. *Mon. Bull. Minist. Hlth Lab. Serv.*, 1963, **22,** 150.

MARKS, J. and BIRN, K. J.
Infection due to *Mycobacterium avium. Brit. med. J.*, 1963, ii, 1503.

MARMION, B. P.
Applications of immunofluorescence in virology. *Proc. R. Soc. Med.*, 1963, **56,** 481.
" Pleuropneumonia-like organisms ". In: *McGraw-Hill yearbook of science and technology.* New York, McGraw-Hill Book Company Inc., 1963, p. 447.

MARMION, B. P. and HERS, J. F. P.
Observations on Eaton primary atypical pneumonia agent and analogous problems in animals. *Amer. Rev. resp. Dis.*, 1963, **88,** No. 3 ii, p. 198.

MILLER, D. L.
A study of techniques for the examination of sputum in a field survey of chronic bronchitis. *Amer. Rev. resp. Dis.*, 1963, **88,** 473.

MITCHISON, D. A., SELKON, J. B. and LLOYD, J.
Virulence in the guinea-pig, susceptibility to hydrogen peroxide, and catalase activity of isoniazid-sensitive tubercle bacilli from South Indian and British patients. *J. Path. Bact.*, 1963, **86,** 377.

MOORE, B.
Methods of ascertainment. In: *Infection in hospitals: epidemiology and control, a symposium organized by C.I.O.M.S.* Edited by R. E. O. Williams and R. A. Shooter. Oxford, Blackwell Scientific Publications, 1963, p. 7.

MOORE, B. and GARDNER, A. M. N.
A study of post-operative wound infection in a provincial general hospital. *J. Hyg., Camb.*, 1963, **61,** 95.

MOSS, P. D., ADAMS, M. O. and TOBIN, J. O'H.
Serological studies with respiratory syncytial virus. *Lancet*, 1963, i, 298.

NAGINGTON, J.
Monolayer tissue culture on ' cellophane ' squares. *Nature, Lond.*, 1963, **200,** 1022.

NOBLE, W. C. and CLAYTON, Y. M.
Fungi in the air of hospital wards. *J. gen. Microbiol.*, 1963, **32,** 397.

NOBLE, W. C. and LIDWELL, O. M.
Environmental contamination. In: *Infection in hospitals: epidemiology and control, a symposium organized by C.I.O.M.S.* Edited by R. E. O. Williams and R. A. Shooter. Oxford, Blackwell Scientific Publications, 1963, p. 87.

NOBLE, W. C., LIDWELL, O. M. and KINGSTON, D.
The size distribution of airborne particles carrying micro-organisms. *J. Hyg., Camb.*, 1963, **61,** 385.

PARKER, M. T. and JEVONS, M. P.
Hospital strains of staphylococci. In: *Infection in hospitals: epidemiology and control, a symposium organized by C.I.O.M.S.* Edited by R. E. O. Williams and R. A. Shooter. Oxford, Blackwell Scientific Publications, 1963, p. 55.

PAYNE, D. J. H.
Streptococcal infection in a school. [Letter] *Lancet*, 1963, i, 266.

PEREIRA, Marguerite S.
Occurrence of adenovirus type 21 in Great Britain. *Brit. med. J.*, 1963, i, 728.

Pereira, Marguerite S., Hambling, M. H., McDonald, J. C. and Zuckerman, A. J.
Viruses from the common cold: a survey in Royal Air Force recruits on arrival from civilian life. *J. Hyg., Camb.*, 1963, **61,** 471.

Richards, J. D. M. and Rycroft, J. A.
Tetracycline-resistant pneumococci. [Letter] *Lancet*, 1963, i, 553.

Shooter, R. A., Thom, B. T., Dunkerley, D. R., Taylor, G. W., Parker, M. T., John, M. and Richards, I. D. G.
Pre-operative segregation of patients in a surgical ward. *Brit. med. J.*, 1963, ii, 1567.

Slater, D. A., Crone, P. B. and Gee, B.
Staphylococcal infection in a general hospital. [Letter] *Lancet*, 1963, i, 55.

Smith, J. W. G.
Immunization against diphtheria and tetanus. *Brit. J. clin. Pract.*, 1963, **17,** 683.
Tetanus prophylaxis. *Curr. Med. Drugs*, 1963, **3,** No. 6, p. 24.

Smith, J. W. G., Evans, D. G., Jones, D. A., Gear, M. W. L., Cunliffe, A. C. and Barr, M.
Simultaneous active and passive immunization against tetanus. *Brit. med. J.*, 1963, i, 237.

Somerson, N. L., Taylor-Robinson, D. and Chanock, R. M.
Hemolysin production as an aid in the identification and quantitation of Eaton agent (*Mycoplasma pneumoniae*). *Amer. J. Hyg.*, 1963, **77,** 122.

Somerson, N. L., Taylor-Robinson, D., Turner, H. C. and Chanock, R. M.
Serological relationships among human mycoplasma as shown by complement-fixation and gel diffusion studies. *Bact. Proc.*, 1963, p. 141.

Steel, K. J.
Notes from the National Collection of Type Cultures—I. *Mon. Bull. Minist. Hlth Lab. Serv.*, 1963, **22,** 60.
Serological classification of *Pasteurella pseudotuberculosis* and *Pasteurella septica. Mon. Bull. Minist. Hlth Lab. Serv.*, 1963, **22,** 176.

Steel, K. J. and Ross, H. E.
Survival of freeze dried bacterial cultures. *J. appl. Bact.*, 1963, **26,** 370.

Taylor, C. E. D., Lea, D. J., Heimer, G. V., and Tomlinson, A. J. H.
Fluorescent antibody techniques in diagnostic bacteriology. *Proc. R. Soc. Med.*, 1963, **56,** 478.

Taylor, Joan
Salmonella infections in hospitals. In: *Infection in hospitals: epidemiology and control, a symposium organized by C.I.O.M.S.* Edited by R. E. O. Williams and R. A. Shooter. Oxford, Blackwell Scientific Publications, 1963, p. 145.
The serotypes of salmonella isolated from foods. *Ann. Inst. Pasteur*, 1963, **104,** 660.

Taylor-Robinson, D.
Intervention. *Arch. ges. Virusforsch.*, 1963, **13,** 82.
Laboratory and volunteer studies on some viruses isolated from common colds (rhinoviruses). *Amer. Rev. resp. Dis.*, 1963, **88,** No. 3, ii, p. 262.
Studies on some viruses (rhinoviruses) isolated from common colds. *Arch. ges. Virusforsch.*, 1963, **13,** 281.

Taylor-Robinson, D. and Bynoe, M. L.
Para-influenza 2 virus infections in adult volunteers. *J. Hyg., Camb.*, 1963, **61,** 407.

Taylor-Robinson, D. and Doggett, J. E.
An assay method for respiratory syncytial virus. *Brit. J. exp. Path.*, 1963, **44,** 473.

Taylor-Robinson, D., Johnson, K. M., Bloom, H. H., Parrott, R. H., Mufson, M. A. and Chanock, R. M.
Rhinovirus neutralizing antibody responses and their measurement. *Amer. J. Hyg.*, 1963, **78,** 285.

Taylor-Robinson, D., Somerson, N. L., Turner, H. C. and Chanock, R. M.
Serological relationships among human mycoplasmas as shown by complement-fixation and gel diffusion. *J. Bact.*, 1963, **85,** 1261.

Taylor-Robinson, D. and Tyrrell, D. A. J.
Virus diseases on Tristan da Cunha. *Trans. R. Soc. trop. Med. Hyg.*, 1963, **57,** 19.

THOMAS, Mair

Acrylic picture varnish for impression films. *Mon. Bull. Minist. Hlth Lab. Serv.* 1963, **22**, 126.

Acrylic picture varnish for thin stained films. *J. clin. Path.*, 1963, **16**, 91.

A blue peroxide slide catalase test. *Mon. Bull. Minist. Hlth Lab. Serv.*, 1963, **22**, 124.

TOBIN, J. O'H.

The isolation of respiratory viruses from children in hospital in south east Lancashire. *Proc. R. Soc. Med.*, 1963, **56**, 991.

WAHBA, A. H.

The production and inactivation of pyocines. *J. Hyg., Camb.*, 1963, **61**, 431.

WAHBA, A. H. and LIDWELL, O. M.

A simple apparatus for colicine typing. *J. appl. Bact.*, 1963, **26**, 246.

WHITE, Anne

A frig. in the home is a must. *Bett. Hlth*, 1963, February, p. 25.

WHITE, Anne and BROOKE, C. O. S. B.

Bacteriology of frozen foods supplied to old people in their homes: the use of insulated containers to prolong storage without refrigeration. *Mon. Bull. Minist. Hlth Lab. Serv.*, 1963, **22**, 103.

WHITE, Anne and HOBBS, B. C.

Refrigeration as a preventive measure in food poisoning. *R. Soc. Hlth J.*, 1963, **83**, 111.

Report on effect of cooking by radio frequency waves on bacteria in food. *Mon. Bull. Minist. Hlth Lab. Serv.*, 1963, **22**, 227.

WILKINSON, A. E.

The fluorescent treponemal antibody test in the serological diagnosis of syphilis. *Proc. R. Soc. Med.*, 1963, **56**, 478.

WILLIAMS, R. E. O. and ASHESHOV, E. A.

Preservation of viruses and bacteriophage. In: *Culture Collections: perspectives and problems.* Edited by S. M. Martin. Toronto, University of Toronto Press, 1963, p. 147.

WILSON, G. S.

Tuberculosis mortality in late adult males. [Summary] *Publ. Hlth, Lond.*, 1963, **77**, 127.

ZUCKERMAN, A. J.

ABO blood groups and other inherited characteristics in acute respiratory virus disease. *University of Birmingham, M.Sc. Thesis*, 1962.

Acute hepatitis in the Royal Air Force. *University of London, M.D. Thesis*, 1963.

ZUCKERMAN, A. J. and MCDONALD, J. C.

ABO blood groups and acute hepatitis. *Brit. med. J.*, 1963, ii, 537.

Reports of the Public Health Laboratory Service, including reports of Committees and Working Parties

Deaths from measles in England and Wales in 1961: a report from the Epidemiological Research Laboratory. *Mon. Bull. Minist. Hlth Lab. Serv.*, 1963, **22**, 167.

Food poisoning in England and Wales, 1962: a report of the Public Health Laboratory Service. *Mon. Bull. Minist. Hlth Lab. Serv.*, 1963, **22**, 200.

A trial of reinforcing doses of diphtheria toxoid absorbed through the buccal mucosa: a report by the Public Health Laboratory Service and the Manchester Education Committee School Health Service. *J. Hyg., Camb.*, 1963, **61**, 425.

Public Health Laboratory Service Act, 1960. Public Health Laboratory Service Board accounts 1961–62. *House of Commons Papers* (Session 1962–63) No. 177.

Public Health Laboratory Service Year Book, 1963.

Reports of Committees and Working Parties of other organisations to which members of the staff have contributed

B.C.G. and vole bacillus vaccines in the prevention of tuberculosis in adolescence and early adult life: third report to the Medical Research Council by their Tuberculosis Vaccines Clinical Trials Committee. *Brit. med. J.*, 1963, i, 973.

The infectiousness of rubella: report by the Epidemic Observation Unit of the College of General Practitioners, prepared by G. I. Watson and J. C. McDonald. *Brit. med. J.*, 1963, ii, 419.

Influence of pretreatment bacterial resistance to isoniazid, thiacetazone or PAS on the response to chemotherapy of African patients with pulmonary tuberculosis: co-operative studies in East African hospitals and laboratories with the collaboration of the East African and British Medical Research Councils. *Tubercle, Lond.*, 1963, **44,** 393.

Minutes of the Enterobacteriaceae Subcommittee meeting, Montreal, August, 1962. *Int. Bull. bact. Nomencl.*, 1963, **13,** 139.

Report of the Subcommittee on Taxonomy of the Enterobacteriaceae. *Int. Bull. bact. Nomencl.*, 1963, **13,** 69.

Report on the outbreak of poliomyelitis during 1961 in Kingston-upon-Hull and the East Riding of Yorkshire. *Rep. publ. Hlth med. Subj., Lond.*, 1963, No. 107.

THATCHER, F. S.

The microbiology of specific frozen foods in relation to public health: report of an international committee. *J. appl. Bact.*, 1963, **26,** 266.

APPENDIX III

AWARDS AND EXTERNAL OFFICES ACCEPTED BY MEMBERS OF THE SERVICE DURING 1963

Dr. J. W. Howie	A Vice-President of the College of Pathologists.
Dr. E. S. Anderson	Membership of the World Health Organisation Expert Advisory Panel on Enteric Diseases.
Dr. S. T. Cowan	Membership of the World Health Organisation Expert Advisory Panel on Enteric Diseases.
Dr. Lynette M. Dowsett	Vice-President of the East Anglian Branch of the Society of Medical Officers of Health.
Dr. Betty C. Hobbs	Admission to the Most Venerable Order of the Hospital of St. John of Jerusalem.
Dr. J. C. McDonald	Honorary Secretary of the Section of Epidemiology and Preventive Medicine of the Royal Society of Medicine, and membership of the Council of Social Medicine.
Dr. J. Marks	Membership of the Editorial Committee of *Tubercle*.
Dr. T. D. F. Money	Chairman of the City of Norwich Medical Committee.
Dr. Joan Taylor	Membership of the Council of the College of Pathologists, and of the Council of the Section of Epidemiology and Preventive Medicine of the Royal Society of Medicine.
Dr. A. E. Wilkinson	Membership of the Council of the Medical Society for the Study of Venereal Diseases.

INDEX TO PERSONAL NAMES

Abbott, J. D., 18
Adams, M. O., 22, 33, 37
Allen, D. R., 32, 35
Alwyn-Smith, P., iii
Anderson, E. S., 6, 9, 22, 25, 31, 32, 33, 41
Andrews, B. E., 10, 22
Angel, J. H., 33
Archer, J. F., 18
Armstrong, E. C., 18
Asheshov, E. A. Hall, 22, 33, 39
Ashton, C., 18
Atkinson, J. D., 17
Ayres, J. C., 35

Bailey, E. M., 23
Baillie, M. B., 18
Baker, F. J., 34
Barr, M., 38
Barrow, G. I., 8, 19, 21, 33
Barton, B. W., 23
Bartram, H. G., 33
Bassett, D. C. J., 7, 19
Bassett, H. F. M., 33
Bate, W., 35
Beare, A. S., 22
Beasley, W. H., 7
Beattie, C. P., 36
Bernstein, A., 8, 33
Bettleheim, K. A., 22, 33
Bhatia, A. L., 33
Birn, K. J., 37
Bloom, H. H., 38
Bloss, J. F. E., 32
Blowers, A. R., 7, 20, 31, 33
Boissard, J. M., 8, 17, 27
Boston, D. G., 35
Bothwell, P. W., 33
Bowie, J. H., 33
Bowman, A., 17
Boycott, J. A., 21, 31, 32
Bradstreet, C. M. P., 23, 24, 25, 26, 30
Brett, G. Z., 33
Bridgwater, F. A. J., 21
Brightwell, S., 31
Brooke, C. O. S. B., 39
Brooksbank, N. H., 32
Brown, T., 18
Buchanan, 9
Burrell, C. D., 34
Bynoe, M. L., 38

Cadness Graves, B. H. E., 21
Carpenter, K. P., 22, 25
Cavanagh, P., 7, 8, 23
Cayton, H. R., 17, 31
Chanock, R. M., 8, 34, 38
Christie, D. R., 19
Churcher, G. M., 20
Clarke, S. K. R., 17, 32, 34
Clayton, Y. M., 34, 37
Clough, A. H., iii
Cockburn, W. C., 35
Codd, A. A., 23
Coe, A. W., 36
Collins, C. H., 20, 34
Conn, C. A., 33
Cook, A. M., 31
Cook, G. T., 19, 32
Cossart, Y. E., 22
Cowan, S. T., 9, 17, 23, 34, 41
Cowlard, J. H., 34
Cradock-Watson, J. E., 18
Croll, J. M., 20, 32
Crone, P. B., 21, 34, 38
Cunliff, A. C., ii, iii, 38

Darmady, E. M., 34
Davies, D. G., 19, 32
Davies, J. R., 9, 20
Davis, H., 31
Davis, P. M., 35
Davis, R. H., 35
Devadatta, S., 33
Dienes, L., 34
Dighero, M. W., 23
Dixon, J. M. S., 19, 34
Doggett, J. E., 38
Donaldson, A. W., 10
Downie, A. W., iii, 27
Dowsett, L. M., 20, 41
Dunkerley, D. R., 38

Eaton, B. R., 18
Eaton, M. D., 34
Edward, D. G. ff., 34
Edwards, J. M. B., 23
Ellis, E. M., 35
Enders, 12
Essex-Cater, A. J., 34
Evans, A. D., 18, 34
Evans, D. G., 34, 38

Fairrie, D. V. T., iii, 17
Fennell, H., 21
Ferguson, W. G., 33
Field, A. M., 22, 34
Field, H. I., 32
Fincham, I. H., 32
Fisher, P. J., 34
Fleck, D. G., 21, 28, 34
Flewett, T. H., 34
Fourman, P., 35
Fox, W., 33
Freeman, B. M., 36
Freundt, E. A., 34
Fry, C. S., 22, 35
Fry, R. M., 8
Furniss, A. L., 20, 32

Galbraith, N. S., 8, 31, 35, 36
Gamble, D. R., 19, 24, 35
Gardner, A. F., 32
Gardner, A. M. N., 37
Gardner, S. D., 22
Garnham, P. C. C., 26
Garrod, L. P., 31
Gay, J. L., 33
Gear, M. W. L., 38
Gee, B., 34, 38
Ghosh, A. C., 23
Gibson, E. A., 32
Gillespie, E. H., 9, 18, 35
Glencross, E. J. C., 20
Glover, L., 9
Goldsmith, H., 7
Goodburn, G. M., 35, 36
Graham, J. M., 21
Gray, R. D., 20
Greaves, R. I. M., 35
Gregg, 11
Grieve, C. M., 22
Griffiths, A. H., 35
Griffiths, P. W. W., 8, 19
Gunnell, A. E., 22

Hale, J. H., 6, 18, 27, 28
Hambling, M. H., 18, 35, 38
Harbourne, J. F., 37
Harris, W. C., 8
Hart, J. M., 22
Harvey, R. W. S., 18, 31, 32, 35
Hatch, L. A., 20
Hayflick, L., 34
Heath, G. B., 32
Heimer, G. V., 38
Henderson, P., 32
Henderson, R. J., 21, 26, 31, 35
Hers, J. F. P., 10, 34, 37
Hickie, G. C., 36
Higgins, P. G., 23, 35
Hill, M. J., 35
Hobbs, B. C.,
  9, 23, 24, 25, 31, 32, 35, 36, 39, 41
Hocking, F. D. M., 7, 21
Hoffman, E., 33
Holt, H. D., 20, 32
Holzel, A., 36
Hooper, W. L., 21
Hope-Simpson, R. E., 23
Howie, J. W., 15, 17, 31, 36, 41
Hoyle, L., 6, 9, 20, 26, 36
Hughes, E., iii
Hughes, K. E. A., 8, 31, 32, 34, 36
Hughes, M. H., 21, 32, 36
Hutchinson, D. N., 23
Hutchinson, R. I., 21

Illingworth, E. M., 22
Ingham, H. R., 18
Ingram, M., 31
Iredale, J. L. G., 19

Jacobs, S. I., 36
James, A. M., 35
James, R. C. J., 17
Jameson, J. E., 19, 32, 36
Janardhanam, B., 33
Jebb, W. H. H., 18, 32, 33
Jellard, C. H., 20
Jensen, K. E., 34
Jephcott, A. E., 23
Jesty, J., 32
Jevons, M. P., 22, 33, 36, 37
John, M., 22, 38
Johnson, K. M., 38
Johnston, H. H., 18, 36
Johnston, N. A., 22
Jones, A. C., 21
Jones, D. A., 38
Jones, D. M., 7, 18, 34
Jones, K. H., 35

Kaul, P. M., 10
Kellaway, T. D., 35
Kelsey, J. C., 9, 22, 24, 31, 33, 36
Kendall, E. J. C., 35
King, A. J., 36
King, G., 22
King, G. J. G., 18, 32
Kingston, D., 22, 36, 37
Kinsley, B. J., 23
Kinsley, M. L., 35
Knox, W. A., 36
Kwantes, W., 21, 31

Lane, W. F., 18, 36
Lapage, S. P., 10, 22
Laurence, B. R., 25
Lea, D. J., 38
Lee, M. M., 22
Lewis, M. J., 23, 36
Ley, F. J., 36
Lidwell, O. M., 22, 33, 36, 37, 39
Limb, L., 17
Little, L. A., 21
Liu, C., 34
Lloyd, J., 37
Logan, J. Stevenson, iii
Loosmore, R. M., 32
Lowe, G. H., 20
Ludlam, G. B., 18, 28, 32, 36

McCoy, J. H., 19, 31, 32, 36
McDiarmid, A., 33
McDonald, J. C.,
  6, 23, 31, 33, 36, 38, 39, 40, 41
McGregor, J. R., iii
Machacek, K. A., 17
Mackay-Scollay, E. M., 9, 21, 32
McLintock, J. S., 35
Macrae, A. D., 5, 22, 25, 26, 27, 28, 32, 35
Mahabir, D. E., 18
Mair, H. J., 20, 36, 37
Mair, N. S., 10, 20, 37
Mann, P. G., 18, 32
Marian, L. Kassa Wolde, 10
Marks, J., 22, 28, 35, 37, 41
Marmion, B. P., 8, 34, 35, 37
Marshall, J., 18, 36
Martin, S. M., 34, 39
Massey, M. L., 34
Maurice-Williams, F. E., 8
Maxted, W. R., 9, 22, 35
Maycock, H. G. T., 19
Menzies, D. W., 32
Midgley, J., 23
Miles, A. A., ii
Miller, D. L., 23, 37

Mitchell, E. R., 7, 20, 32
Mitchison, D. A., 37
Money, T. D. F., 20, 32, 41
Moore, B., iii, 19, 31, 32, 37
Morgan, D. B., 35
Morgan, H. D. S., 7, 19, 31
Morris, C. A., 17
Morton, H. E., 34
Moss, P. D., 37
Mufson, M. A., 34, 38
Murray, I. G., 9, 22, 25

Naginton, J., 17, 35, 37
Naylor, G. R. E., 8, 17
Noble, W. C., 34, 37

Oakley, C. L., 24
Odrzywolski, W., 18

Parker, L., 36
Parker, M. T., 9, 17, 22, 26, 27, 31, 36, 37, 38
Parrott, R. H., 38
Pashley, M. M., 22
Patterson, W. H., 36
Paulley, J. W., 34
Payling Wright, G., 9
Payne, D. J. H., 8, 20, 24, 32, 37
Payne, R. A., 34
Peckham, C. S., 23
Pereira, M. S., 9, 22, 37, 38
Peters, R. V., 23, 32
Philpot, C., 22
Pilsworth, R., 19
Plows, C. R., 18
Polakoff, S., 22
Pollock, T. M., 23
Poole, P. M., 7, 19, 32
Powell, D. E. B., 34
Preston, A. E., 33
Price, I. N. O., 36
Price, T. H., 35

Radhakrishna, S., 33
Ramakrishnan, C. V., 33
Richards, I. D. G., 8, 38
Richards, J. D. M., 38
Richards, M., 35
Ridley, D. S., 26
Robertson, L., 21, 32
Robinson, D. T., 18, 24, 31
Roden, A. T., 32
Rogers, A. H., 33
Ross, H. E., 23, 38
Ryan, W. J., 19
Rycroft, J. A., 21, 38

Sabin, 13
Sanderson, P. J., 23
Sandiford, B. R., 18, 32
Scarlett, C. A., 32
Selkon, J. B., 18, 33, 37
Sequeira, P. J. L., 28
Shooter, R. A., 36, 37, 38
Sinclair, W. B. V., 32
Skan, D. A., 20
Slater, D. A., 38
Smith, A. J. Kingsley, 19
Smith, H. G. M., 19
Smith, J. W. G., 8, 34, 35, 38
Smith, P. F., 34
Sojka, W. J., 32
Somerson, N. L., 34, 38
Spooner, E. T. C., ii, iii
Steel, K. J., 23, 38
Stevens, C. C., iii
Stott, H., 33
Stuart-Harris, C. H., iii
Swann, 11
Swindell, F., 34
Sykes, G., 31

Tannahill, A. J., 23
Tanner, E. I., 19, 34
Taylor, C. E. D., 17, 33, 38
Taylor, G. W., 38
Taylor, J., iii, 9, 22, 24, 25, 27, 31, 32, 38, 41
Taylor-Robinson, D., 8, 23, 34, 38
Tee, G. H., 19, 32
Thatcher, F. S., 40
Thom, B. T., 17, 38
Thomas, M., 34
Thomas, M. E. M., 17, 39
Thompson, G. R., 33
Thompson, K. M., 33, 36
Thompson, M. E., 22
Thomson, D., iii
Thomson, L., ii
Thomson, Scott, 18, 27
Tobin, J. O'H., 18, 32, 33, 36, 37, 39
Tomlinson, A. H., 18, 31
Tomlinson, A. J. H., 9, 20, 24, 31, 38
Tooth, J. A., 23
Tuke, W., 34
Turner, H. C., 38
Turner, L. H., 26
Tyrrell, D. A. J., 38

Velu, S., 33
Ven, J. A. J., 32
Vernon, E. D., 23
Vollum, R. L., 7, 18, 27

Wahba, A. H., 6, 39
Wallace, J. G., 8, 20
Walton, M., 33
Warin, R. P., 34
Watkinson, J. M., 18
Watson, G. I., iii, 40
Whitaker, C. K., 17
White, A., 39
White, G. B. B., 18
White, L. L. R., 36
Whitehead, J. E. M., 19, 32
Whyte, B. H., 10, 17
Wilkinson, A. E., 9, 22, 28, 30, 35, 36, 39, 41
Williams, E. V., 22
Williams, R. E. O.,
  ii, iii, 31, 33, 35, 36, 37, 38, 39
Willis, A. T., 36
Wilson, E. M. J., 33
Wilson, G. S., 15, 17, 31, 39
Wilson, J. Greenwood, 31
Wilson, M. A. M., 18
Winchester, J. S., 23
Wood, J. M., 17
Wood, N., 21, 32
Wormald, P. J., 21, 32
Wright, A. E., 21

Zuckerman, A. J., 17, 38, 39

Printed by H.M. Stationery Office Press, Harrow
(89757) Wt. P.11773/15 900 6/64

BRIT [illegible] CIL
30 SEP 1964
MEDICAL LIBRARY